A Database Publication

ATARI USER

Vol. 3 No. 4 August 1987 £1

How well does James Bond translate to the Atari?



THE LIVING DAYLIGHTS



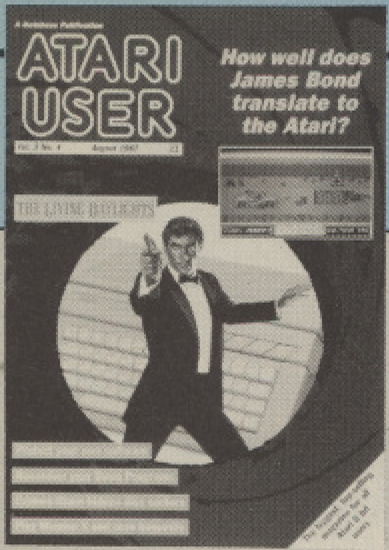
Protect your own software

Renumber your Basic Programs

Explore those hidden disc sectors

Play Mission X and save humanity

The biggest, top-selling magazine for all Atari 8 bit users



Vol. 3 No. 4 August 1987

Managing Editor:
Derek Meakin

Features Editor:
Peter Davidson

Production Editor:
Peter Glover

Art Editor:
Heather Sheldrick

Reviews Editor:
Christopher Payne

News Editor:
Mike Cowley

Technical Editor:
André Willey

Advertisement Manager:
Tony Nowell

Advertising Sales:
John Snowden
Nora Lawton

Editorial: 061-456 8383
Administration: 061-456 8383
Advertising: 061-456 8500
Subscriptions: 061-480 0171
Telecom Gold: 72:MAG001
Telex: 265871 MONREF G
Quoting Ref. 72:MAG001
Prestel Mailbox: 614568383

Published by:
Database Publications Ltd,
Europa House, 68 Chester Road,
Hazel Grove, Stockport SK7 5NY.

ABC 33,573 January-June, 1986

Subscription rates for 12 issues, post free:

£12 – UK
£18 – Europe
£30 – Overseas

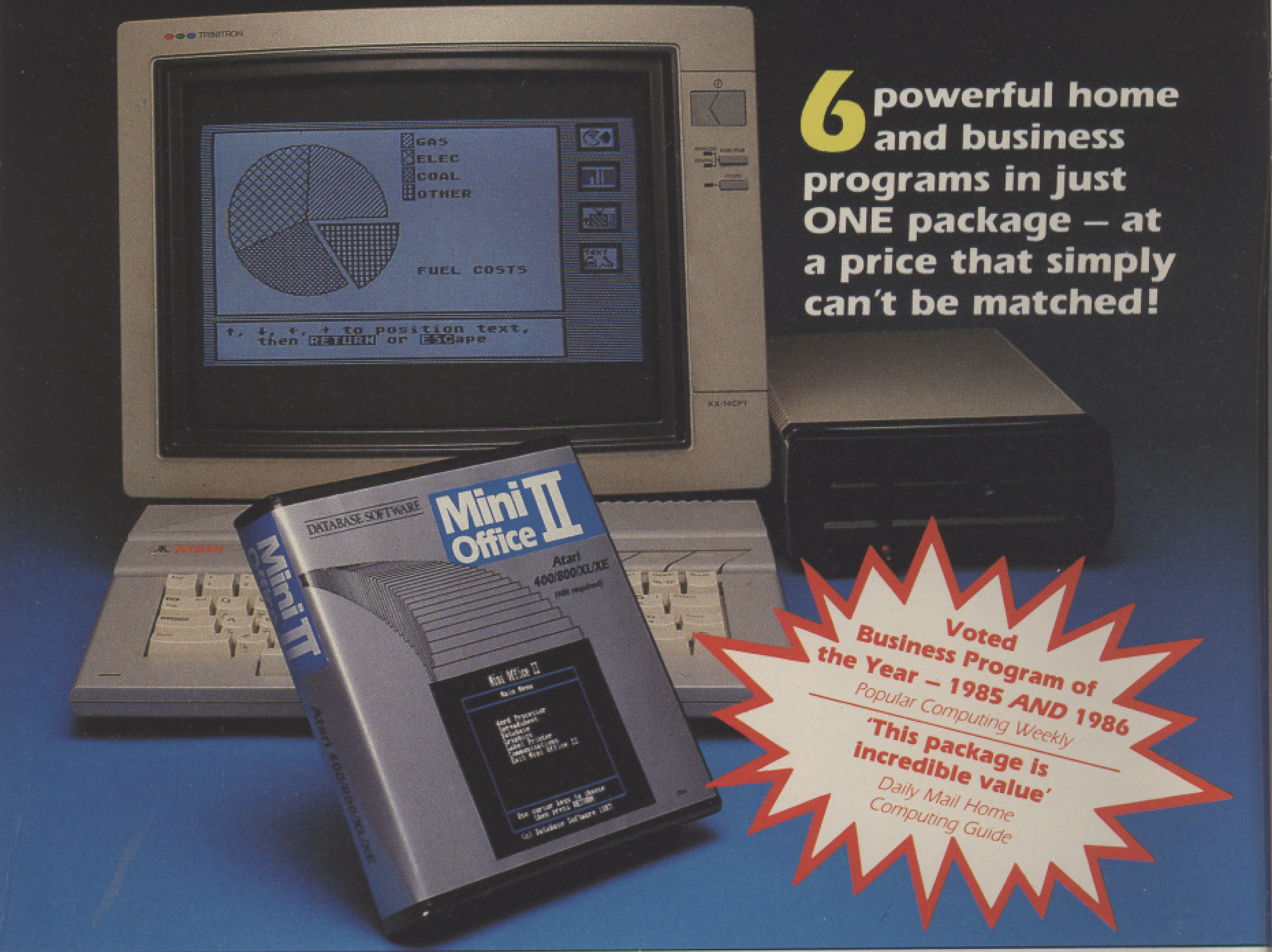
ISSN 0266-545X

"Atari User" welcomes program listings and articles for publication. Material should be typed or computer-printed, and preferably double-spaced. Program listings should be accommpanied by cassette tape or disc. Please enclose stamped, self-addressed envelope, otherwise the return of material cannot be guaranteed. Contributions accepted for publication by Database Publications Ltd will be on an all-rights basis.

News trade distribution: Europress Sales and Distribution Limited, Unit 1, Burgess Road, Ivyhouse Lane, Hastings, East Sussex TN35 4NR. Tel: 0424 430422.

Contents

Mini Office II



WORD PROCESSOR
Compose a letter, set the print-out options using embedded commands or menus, use the mail merge facility to produce personalised circulars – and more!

SPREADSHEET
Prepare budgets or tables, total columns or rows with ease, copy formulae absolutely or relatively, use a wide selection of mathematical and scientific functions, recalculate automatically – and more!

GRAPHICS
Enter data directly or load data from the spreadsheet, produce pie charts, display bar charts side by side or stacked, overlay line graphs – and more!

DATABASE
Build up a versatile card index, use the flexible print-out routine, do powerful multi-field sorting, perform all arithmetic functions, link with the word processor – and more!

COMMS MODULE
Using a modem you can access services such as MicroLink and order a wide range of goods from flowers to software, send electronic mail, telex and tele-messages in a flash – and more!

LABEL PRINTER
Design the layout of a label with the easy-to-use editor, select label size and sheet format, read in database files, print out in any quantity – and more!

DATABASE SOFTWARE **Europa House, 68 Chester Road, Hazel Grove, Stockport SK7 5NY**

ORDER FORM

Please send me Mini Office II for the Atari 400/800/XL/XE (48k required), on 5¼″ disc for £19.95

I enclose cheque made payable to Database Software, or debit my Access/Visa card:

☐☐☐☐ ☐☐☐☐ ☐☐☐☐ ☐☐☐☐

Exp. date ☐

Signed ....

Name ....

Address ....

....

....

ORDER HOTLINE: TEL: 061-480 0171

SEND TO: **Database Software, Europa House, 68 Chester Road, Hazel Grove, Stockport SK7 5NY.**

AT8

Atari drive in big High Street stores

NEGOTIATIONS are under way with a number of major High Street stores to secure distribution contracts for Atari computers and games consoles in time for the Christmas market.

So far there has been a cautious response from some retailers, but Dixons and Currys have confirmed that they will be stocking the VCS 2600 games console as well as the 65XE.

Atari UK sales and marketing manager Paul Welch said: "We are also talking to Woolworths, but they are waiting to see our XE machine before deciding just what to take".

The other High Street giant, Boots, has made no firm commitment to Atari as it is currently evaluating the machines to see where they would fit in to their overall sales policy.

A computer magazine report that Atari had done a deal to dump a large quantity of machines with Dixons and Currys has been officially denied by Atari spokesman Peter Walker.

More titles for VCS

GAMES for the new Atari VCS 2600 console are reported to be in plentiful supply according Atari's Spokesman Peter Walker.

More than 25 titles are currently being supported by the company, but the games base is much larger than that.

Crystal Castles, Solaris, Star Gate and Midnight Magic are just some of the new releases that are available with a retail price of £9.95.

However, cartridges that fitted the old VCS games console are also compatible with the new machine.

60 new games for the XE65 have also been released, with prices ranging from £4.99 to £9.99







Piracy cuts the price of games in Spain

ATARI games players in Spain would seem to be getting a better deal than their English counterparts.

Along with cut price holidays and cheap drinks, software for the Atari has now joined the list of bargains to be had by British tourists.

Games that would normally sell for around £9 here can be bought quite legally for a little over £4 in Spain.

Audiogenic, US Gold, Imagine, and Alligata software are just some of the top brand names that can be bought at the budget prices.

According to a spokesman for one leading software house the reason for the discrepancy lies in the fact that piracy in Spain is rife.

"If the Spanish can rip off a game then they will. The only way we could combat the pirate tapes was by reducing the price to a point where it was not economic for illegal copies to be made", he said.

Erbe, the Spanish company which produces games for many British software houses under licence, pointed out the situation and suggested that a price cut was the only way to boost sales.

The policy has obviously worked. Many of the British software houses have reported Spanish profits up by as much as 300 per cent.

Daryll Still of Audiogenic said: "Our games have sold well in Spain for years, the only trouble is that they have been illegal copies.

"The only way that we could make our presence felt was by reducing our prices.

"And it's not just Spain. We are having an even worse time in Italy. Our games have been selling well there for a long time, but not one of them is a legal copy".

Serious suite hits the charts again

YOU can't keep a good program down...which is why the serious software suite which sells as fast as games keeps popping up in the charts.

Mini Office II, the six programs in one package from Database Software for Atari 8 bit machines, is making a big impression in the Atari Top 20 compiled by Gallup.

It is currently at number eight – the only serious product to get within a mile of the best-selling software charts.

This is after coming back in at number 17 the previous week after briefly slipping out of the Atari Top 20.

Launched at the Atari User Show in London in April, the £19.95 disc – with its word processor, spreadsheet, database, graphics, comms and label printing modules – was an instant hit.

Since then it has frequently outsold some of the leading Atari entertainment software to earn a Top 20 place.

Link your Atari to the outside world with...

MicroLink

Electronic mail – The cheapest and fastest form of communication possible. It costs the same to send a message to one mailbox as to 500!

Telex – Link up with 96,000 telex subscribers in the UK and 1.5 million worldwide. You can even send and receive telexes after office hours or while travelling.

Telemessages – Type in your message before 8pm and delivery is guaranteed by first post the next day (except Sunday), anywhere in the UK and USA.

Tele-booking – Reserve train and theatre tickets, check flight details worldwide, or order from a vast range of products – from flowers to floppy discs.

Telesoftware – Download directly into your Atari any program from the ever-growing library now available on MicroLink – both games and utilities.

Company searches – Obtain facts about any British limited company in seconds, and fully analysed financial information on over 100,000 major companies.

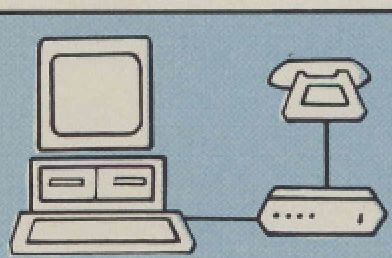
Typesetting – Send copy from your word processor together with details of type size and style, and you'll receive pages ready for printing within 24 hours.

News – Use the powerful search commands to pinpoint vital business information from the world's leading news services, newspapers and periodicals.

Radiopaging – If you also have a pocket radiopager you'll be alerted each time an urgent message arrives in your mailbox. So you're always in touch.

Gateways – Get through to New York in just five seconds – or key into the EEC computer in Luxembourg, which links you to 600 databases throughout Europe.

When you join MicroLink you've got the world of communications at your fingertips – 24 hours a day. You'll have immediate access to ALL the facilities offered by Telecom Gold ... and a great deal more besides.



All you need – apart from your Atari – is a modem, which plugs into your telephone wall socket, plus suitable communications software.

We have provided two possible options on the left.

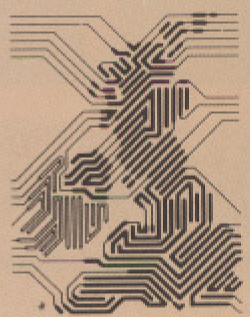
Whichever equipment you use, you will be able to call MicroLink, open your mailbox, save to disc any messages waiting for you, and disconnect in as little as two minutes.

Two recommended packages

If you have an 850 interface:
Pace Nightingale manual modem + cable (£116.15) PLUS Mini Office II (£19.95).
Total price: £136.10.

If you don't have an interface:
Miracle WS2000 V21, V23 modem + Datatari interface + cable + Viewterm software.
Total price: £149.95.

With either combination you can also log on to other databases and bulletin boards all round the world.



More than 90 per cent of subscribers can connect to the MicroLink computer at local call rates.

TO FIND OUT MORE
Fill in the coupon and send it to the address below. You will receive full details of services and costs, together with an application form. Complete this and within days you and your Atari will be able to use all the services of MicroLink and Telecom Gold.

Please send me full details about MicroLink, and information sheets about the following hardware and software options (please tick):

☐ Pace package ☐ Miracle package

Name________________

Address________________

____

Postcode________________

Send to: MicroLink, Europa House, 68 Chester Road, Hazel Grove, Stockport SK7 5NY.

ATU8

News

Atari joins in the race game

ATARI has taken its place on the starting grid with a host of other fast movers by sponsoring racing car driver David Brodie's BMW works Starion Turbo.

The vehicle has been specially set up for top performance. It can reach speeds of up to 180 mph and can go from 0 to 60 in just 3.8 seconds.

"The Starion Turbo is a very fast machine, matching in many ways the attributes of the Atari personal computer range – it's fast and reliable", said David Brodie.

The BMW was seen for the first time at this year's touring car championship at Silverstone where it came an impressive second out of 18 competitors.

Atari's sponsorship is part of an overall policy to increase the company's public image. This year alone it plans on spending £3 million in press and TV advertising.

Atari used the event to confirm that it is to relaunch the 130XE computer as a tutorial machine for first-time computer users.

The package will contain the 64k 130XE, data recorder and bundled software. Price £139.99.

The VCS 2600 and 65XE games machines will sell for £49.99 and £79.99 respectively.

A 65XE with an upgrade which turns it into a fully operational computer was also announced at £119.99.



David Brodie with his BMW: "Fast and reliable – like the Atari"

Domain of the Undead comes back to life

FOUR popular games for the Atari 8 bit series have been bundled in a new compilation by Red Rat Software (061–835 1055).

Laser Hawk, Domain of the Undead, Panic Express and Escape from Doom World are the first in a new series of Four Star software releases priced at £7.95 on cassette and £9.95 on disc.

Don Rigby, director of Red Rat, told *Atari User:* "The games on this compilation have been very popular in the past. Domain of the Undead reached number two in the software charts. Now that it is being sold with three other titles it is tremendous value for money".

The Gallup Chart Top 20 Atari Software

This Month	Last Month	Title (Software House)	Price
1	1	**GAUNTLET** *US Gold*	9.95
2	•	**ASTROMEDA** *Budgie*	1.99
3	3	**MICRO RHYTHM** *Firebird*	1.99
4	2	**ATTACK OF THE MUTANT CAMELS** *Mastertronic*	1.99
5	14	**SILENT SERVICE** *Microprose/US Gold*	9.95
6	3	**DEATH RACE** *Atlantis*	2.99
7	•	**GUN LAW** *Mastertronic*	4.99
8	9	**GUN LAW** *Mastertronic*	1.99
9	11	**LEADERBOARD** *Access/US Gold*	9.95
10	13	**STRATOSPHERE** *Players*	1.99
11	12	**FOUR GREAT GAMES** *Micro Value*	3.99
12	•	**LOCO** *Alligata*	2.99
13	•	**FOOTBALL MANAGER** *Addictive*	2.99
14	5	**COLONY** *Bulldog*	1.99
15	18	**MINI OFFICE II** *Database*	19.95
16	8	**ARKANOID** *Imagine*	8.95
17	6	**FRENESIS** *Mastertronic*	1.99
18	19	**GREEN BERET** *Imagine*	8.95
19	•	**TOURNAMENT LEADERBOARD** *Access/US Gold*	9.95
20	17	**NINJA** *Mastertronic*	1.99

Compiled by Gallup/Microscope

Gauntlet stays at the top of the poll for the second month running. Look out for Deeper Dungeons which is now available. It enters the charts at number seven and is reviewed in this issue. Another sequel, Tournament Leaderboard, enters this month at 19.

The name's Bond...

NIEL FAWCETT takes on the mission to test game-of-the-film The Living Daylights

Program: The Living Daylights
Price: £9.95 (cass), £12.95 (disc)
Supplier: Domark, 204 Worple Road, London SW20 8PN.
Tel: 01-947 5622

JAMES Bond, the super smooth secret agent who's licensed to thrill, now turns up on the Atari in a new game based on his latest film, The Living Daylights.

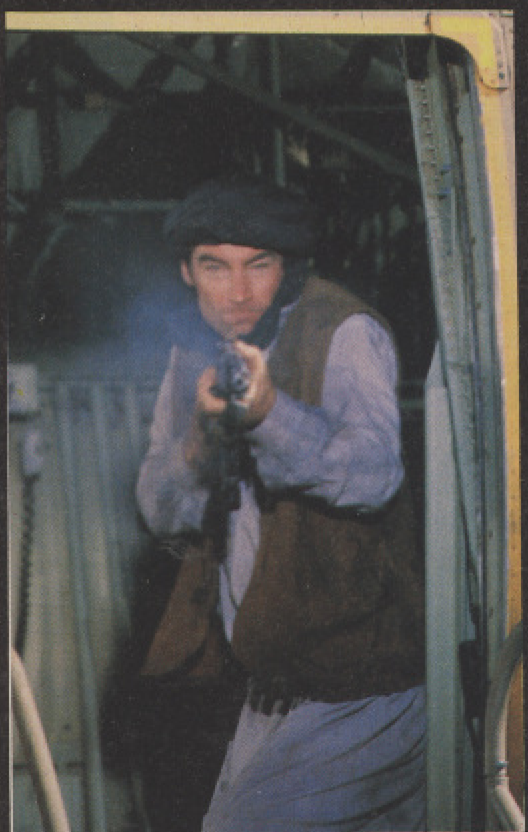
And it's been well worth waiting for.

The eight levels of the game are based on actual locations from the film. Your job is to guide 007 on his daring missions.

The tasks are very similar to those that Bond has to complete in the film itself.

So into the drive with the disc and prepare yourself for the first of Bond's exploits – testing the defence system of Gibraltar.

Armed with a paint pellet gun you are pitched against the SAS. To attack you simply press fire, to exit move the gun sight to the top of the screen.



Timothy Dalton takes aim in a scene from the film

The paint gun is being used because it is not sporting to shoot your own men. But you to can change to the faithful old Walther PPK when the Russian agent appears.

To do this simply move your gun-sight to the bottom of the screen and press Fire to select your weapon from the scrolling window.

As you run to the right Gibraltar scrolls off very smoothly to the left, with the backdrop shifting at different rates so as to heighten the realism.

007 is nicely animated too – mind you if the SAS kept popping up from behind rocks and bushes for a pot shot I would be nicely animated too.

Actually they're only supposed to have paint pellets as well, but one of them may be a Russian assassin kitted out with real slugs.

As you run along you must negotiate rocks which can trip you up, leaving you a sitting duck for anyone who fancies a shot. A hit also saps your strength and eventually leads to the loss of a life.

Levels are completed by reaching the extreme right. Between one level and the next Bond has five seconds in Q's workshop to pick one of those wonderful gadgets or weapons. This is in addition to the standard Walther PPK that he always carries. Only one from the selection will be effective so some trial and error is in order.

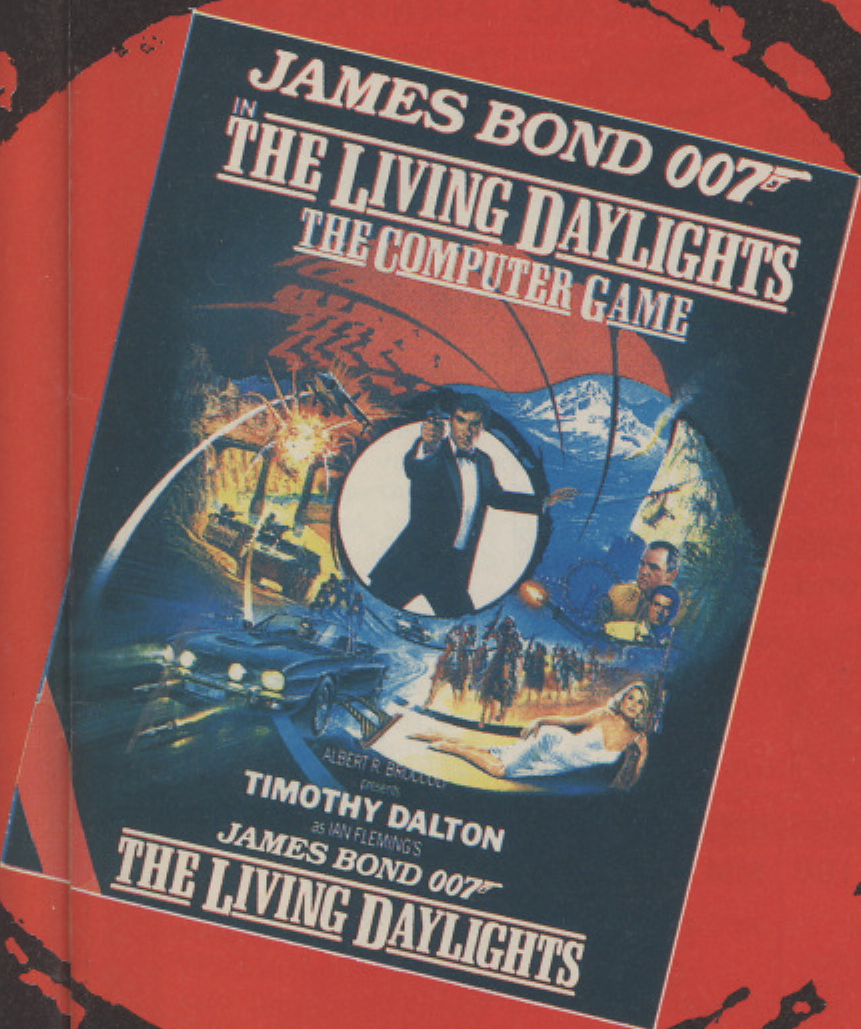
As the game progresses Bond has to contend with a hostile helicopter, a maniacal milkman, killer balloons, guards and the villain of the piece – Brad Whittaker.

If The Living Daylights has a failing it's the fact that the gameplay is almost the same on each level. The scenery changes but basically you're always contending with the similar hazards in different guises and combinations. More variety would have made it an even better game.

As it stands the game is nicely packaged with a lovely title page showing Timothy Dalton and his old chum Walther. The graphics are clever, with very effective scrolling. The sound effects leave a little to be desired during the game but the title music more than makes up for this.

All in all this is a good piece of software, well worth the price. So if you feel like taking on the world this is the game for you.

Living Daylights is the work of John Kavanagh and Patrick McCormick, aged 19 and 21, of Green Beret from Imagine fame. At present they are working on games for the Atari ST and Amiga – so look out for a scoring shoot'em up from this pair due to be announced soon.





Level 1 – Gibraltar



Level 3 – Pipeline



Level 8 – Whittaker's house

Tape and disc security

LEN GOLDING shows you how to keep the pirates off your Basic programs



HOW many of you suffer from meddlers who love to tamper with Basic programs you've spent weeks perfecting? We are constantly being asked for advice on how to make such listings harder to crack, and various dodges have appeared in *Atari User*.

This month we bring together several of the best ideas in a couple of programs that will do all the work for you.

Programs I and II provide several layers of protection for cassette and disc-based software respectively. With this system, your Basic programs are converted into autoboot files which can be loaded only at power-on time and don't appear in disc directories.

The Break key is disabled, and cannot be accidentally re-enabled by any standard Basic command such as GRAPHICS 0 or END. The System Reset routine is modified, so that pressing the Reset key will simply run the program again.

Finally the variable name table is scrambled, so that even if a user manages to break into your listing, it will be extremely difficult to decipher.

We won't bore you with all the machine code details – just use the Basic listings and take our word for it that they work.

Here's how to use Program I to protect cassette-based software. Type in the listing and save it. You should not need this version again, but it is always wise to save your work in case any errors made as you keyed the program in cause problems later.

Now run the program and after a few seconds you will hear the familiar two beeps. Insert a new tape and follow the usual CSAVE procedure to create a master file, which you will use from now on.

When the cassette motor stops rewind the tape and load the master file. It's in autoboot format, so you must switch the computer off and on again while holding down the Start key.

When the single beep sounds follow the usual CLOAD procedure, and the master file will load into memory before the READY message appears. You can check that it's safely installed by typing:

```
PRINT PEEK(1816).
```

The result should be 104.

Now load the Basic program you want to protect just as though the master file wasn't there. When it's loaded insert a blank, fully rewound tape and type:

```
X=USR(1816).
```

Follow the CSAVE procedure, and your Basic program will be written in protected form to the cassette. That's all there is to it.

To load the protected file follow the autoboot procedure as described above using the Start key. The autoboot and protection routines will increase the loading time by about 40 seconds.

Program II protects disc-based programs using similar techniques, although the machine code is substantially different. Type it in, save a backup copy and run it to create a master AUTORUN.SYS file. Switch power off then on again to boot this master file, and check it is correctly installed by typing:

```
PRINT PEEK(1571).
```

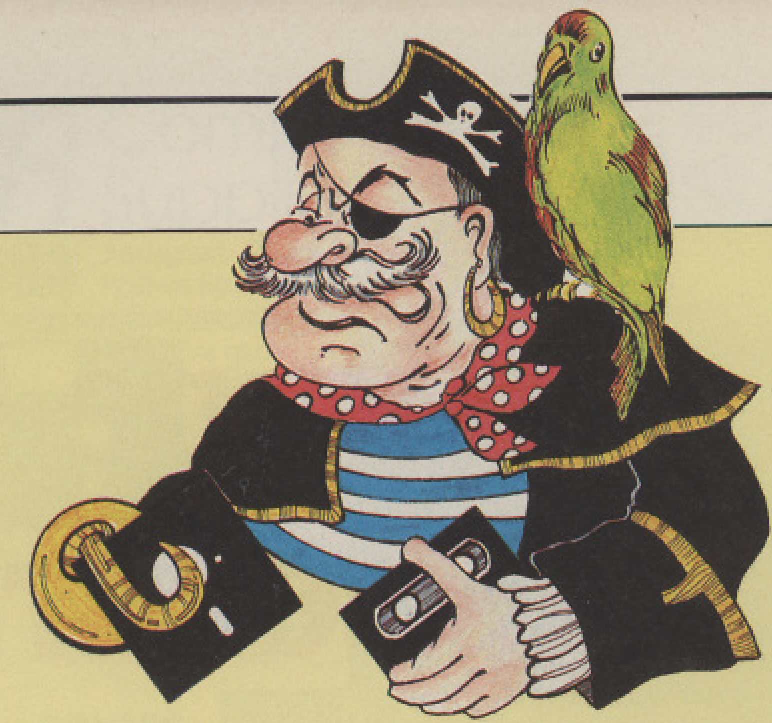
You should get 104.

Now load the Basic program you want to protect, just as though the master routine wasn't there. Insert a new disc which is formatted but doesn't contain any files – not even DOS.SYS or DUP.SYS – then type:

```
X=USR(1571).
```

Your Basic file will be written to disc in autoboot format so there will be no sign of it on a disc directory and none of the Dos commands can be used to break into it.

Turn to Page 12 ▶



Program I

```
10 REM Makes an autoboot cassette mast
er file, which can be used to save
20 REM Basic programs in autoboot cass
ette format with added protection
30 BFR=(PEEK(106)-24)*256:REM reserve
a safe area at the top of RAM as a tem
porary buffer
40 FOR X=0 TO 46:READ D:POKE 1536+X,D:
NEXT X:REM Load the Autoboot creator p
rogram into page 6
50 DATA 104,104,133,204,104,133,203,10
4,133,206,104,133,205,162,16,169,11,15
7,66,3
60 DATA 165,203,157,68,3,165,204,157,6
9,3,165,205,157,72,3,165,206,157,73,3
70 DATA 32,86,228,96,67,58,155
80 REM Load the program temporarily in
to the reserved buffer space
90 X=0:RESTORE 160
100 READ D:IF D=-1 THEN 130
110 POKE BFR+X,D:X=X+1:GOTO 100
120 REM Now read the data from the tem
porary buffer into an Autoboot cassett
e file
130 OPEN #1,8,128,"C:"
140 X=USR(1536,BFR,PEEK(BFR+1)*128)
150 END
160 DATA 0,5,0,7,13,7,169,60,141,2,211
,24,96,169,7,141,231,2,169,9
170 DATA 141,232,2,96,104,165,130,133,
203,165,131,133,204,165,132,56,229,130
,141,223
180 DATA 8,165,133,229,131,170,240,16,
160,0,169,155,145,203,136,208,251,230,
204,202
190 DATA 48,9,208,244,169,155,172,223,
8,208,237,145,130,162,13,181,128,157,2
49,8
200 DATA 202,16,248,165,140,141,227,8,
56,233,228,141,229,8,165,141,141,228,8
,233
210 DATA 7,141,230,8,10,141,229,7,173,
229,8,240,8,16,3,238,229,7,238,229
220 DATA 7,169,228,141,225,8,169,7,141
,226,8,32,141,7,32,175,7,32,217,7
230 DATA 96,162,16,169,3,141,82,3,169,
8,141,90,3,169,128,141,91,3,169,172
240 DATA 141,84,3,169,7,141,85,3,32,86
,228,96,67,58,155,162,16,169,11,141
250 DATA 82,3,173,225,8,141,84,3,173,2
26,8,141,85,3,173,227,8,56,237,225
260 DATA 8,141,88,3,173,228,8,237,226,
8,141,89,3,32,86,228,96,162,16,169
270 DATA 12,141,82,3,32,86,228,96,0,0,
228,7,63,8,169,4,141,197,2,169
280 DATA 60,141,2,211,162,0,189,26,3,2
01,69,240,5,232,232,232,208,244,232,14
2
290 DATA 232,8,189,26,3,133,203,232,18
9,26,3,133,204,160,15,177,203,153,233,
8
300 DATA 136,16,248,169,182,141,237,8,
169,8,141,238,8,32,168,8,169,76,133,20
5
310 DATA 169,8,133,206,169,12,141,231,
8,169,0,141,223,8,141,224,8,24,96,173
320 DATA 5,9,141,231,2,173,6,9,141,232
,2,96,88,61,85,83,82,40,50,49
330 DATA 51,54,41,155,104,162,13,189,2
49,8,149,128,202,16,248,169,107,133,2,
169
340 DATA 8,133,3,169,4,141,197,2,169,1
44,141,54,2,169,8,141,55,2,32,147
350 DATA 8,165,128,141,231,2,165,129,1
41,232,2,96,71,82,46,48,58,82,85,78
360 DATA 88,104,64,169,136,133,205,169
,8,133,206,169,8,141,231,8,141,224,8,1
69
370 DATA 0,141,223,8,174,232,8,169,233
,157,26,3,232,169,8,157,26,3,96,172
380 DATA 223,8,204,231,8,240,8,177,205
,238,223,8,160,1,96,173,224,8,240,18
390 DATA 172,232,8,165,203,153,26,3,20
0,165,204,153,26,3,169,155,160,1,96,-1
```

Get it right!

LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
10	19029	20	19578	30	21121
40	21859	50	12019	60	10982
70	4362	80	17536	90	2903
100	4320	110	5141	120	21671
130	3015	140	5780	150	836
160	9449	170	12061	180	12042
190	11605	200	11501	210	10456
220	10197	230	10713	240	10659
250	10386	260	10558	270	9994
280	10999	290	11121	300	11237
310	10837	320	9712	330	11383
340	10136	350	10708	360	11474
370	10676	380	10643	390	10916

Program II

```
10 REM makes a master AUTORUN.SYS file
, which can then be used to put
20 REM Basic programs into Autoboot di
sc files, with added protection.
30 TRAP 70
40 OPEN #1,8,0,"D:AUTORUN.SYS"
50 READ D:IF D=-1 THEN 70
60 PUT #1,D:GOTO 50
70 END
80 DATA 255,255,0,6,197,6
90 DATA 165,12,141,22,6,165,13,141,23,
6,169,21,133,12,169,6,133,13,76,24
100 DATA 6,32,34,6,169,28,141,231,2,16
9,30,141,232,2,96,104,165,130,133,203
110 DATA 165,131,133,204,165,132,56,22
9,130,141,246,29,165,133,229,131,170,2
40,16,160
120 DATA 0,169,155,145,203,136,208,251
,230,204,202,48,9,208,244,169,155,172,
246,29
130 DATA 208,237,145,130,162,13,181,12
8,157,14,30,202,16,248,165,140,56,233,
0,141
140 DATA 250,29,165,141,233,29,141,251
,29,10,141,1,29,173,250,29,240,8,16,3
150 DATA 238,1,29,238,1,29,173,1,29,14
1,246,29,169,1,141,1,3,169,87,141
160 DATA 2,3,169,0,141,4,3,169,29,141,
5,3,169,1,141,10,3,169,0,141
170 DATA 11,3,32,83,228,48,30,173,4,3,
24,105,128,141,4,3,173,5,3,105
180 DATA 0,141,5,3,238,10,3,208,3,238,
11,3,206,246,29,208,221,96,0,29
190 DATA 245,29,0,0,0,29,86,29,169,4,1
41,197,2,162,0,189,26,3,201,69
200 DATA 240,5,232,232,232,208,244,232
,142,253,29,189,26,3,133,203,232,189,2
6,3
210 DATA 133,204,160,15,177,203,153,25
4,29,136,16,248,169,205,141,2,30,169,2
9,141
220 DATA 3,30,32,191,29,169,99,133,205
,169,29,133,206,169,12,141,252,29,169,
0
230 DATA 141,246,29,141,247,29,24,96,1
73,26,30,141,231,2,173,27,30,141,232,2
240 DATA 96,88,61,85,83,82,40,55,53,51
,53,41,155,104,162,13,189,14,30,149
250 DATA 128,202,16,248,169,130,133,12
,169,29,133,13,169,4,141,197,2,169,167
,141
260 DATA 54,2,169,29,141,55,2,32,170,2
9,165,128,141,231,2,165,129,141,232,2
270 DATA 96,71,82,46,48,58,82,85,78,88
,104,64,169,159,133,205,169,29,133,206
280 DATA 169,8,141,252,29,141,247,29,1
69,0,141,246,29,174,253,29,169,254,157
,26
290 DATA 3,232,169,29,157,26,3,96,172,
246,29,204,252,29,240,8,177,205,238,24
6
300 DATA 29,160,1,96,173,247,29,240,18
,172,253,29,165,203,153,26,3,200,165,2
04
310 DATA 153,26,3,169,155,160,1,96,224
,2,225,2,0,6,-1
```

Get it right!

LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
10	17144	20	18528	30	1392
40	5165	50	4131	60	2876
70	836	80	3548	90	10587
100	10705	110	12205	120	11902
130	11618	140	10778	150	10157
160	9257	170	9844	180	9868
190	9824	200	11386	210	11636
220	11191	230	10865	240	10738
250	11530	260	10726	270	11119
280	11498	290	11256	300	11370
310	7595				

Your lines are numbered . . .

LEN GOLDING gives you a utility to reorganise your Basic programs

BY the time you've finished developing a long Basic program, the chances are that your line numbers will be very untidy and difficult to follow.

This utility will renumber any Basic program automatically, along with all GOTO, GOSUB and other embedded line references, at about 250 lines per second. Since it's entirely in machine code, there's no risk that it will invade the memory area used by your Basic program, and it's not affected by Break or System Reset. It will also run on any Atari 8 bit computer, with any version of Atari Basic.

Programs I and II contain the cassette and disc versions respectively. They both create a master file which loads automatically when you switch power on, and contain only the machine code routine.

Let's look at the cassette version first. Type in Program I and save it. Insert a blank, fully rewound tape, type RUN and hit Return. In about 10 seconds you will hear the familiar double beep. Follow the usual CSAVE procedure, and the master file will be created automatically. Program I can now be discarded.

To use the renumber routine you must first load the master file. Since it's in autoboot format, switch power on while holding down Start then proceed as for CLOAD.

It takes about 45 seconds, then READY will appear as usual. Check that the routine is safely installed by typing PRINT PEEK(1800) – you should get 76.

Now load the program you want renumbering, type X=USR(1800) and hit Return. It will be instantly renumbered in increments of 10, starting at line 10. You can easily specify different values for the starting line number and increment.

The disc version is even easier to make and use. Once you have typed in and saved program II, run it to create the master AUTORUN.SYS file. Load it into memory by switching the power off then on again, and check the code is in place by typing X=USR(7500) – you should get 169.

Load the Basic program you want to renumber, type X=USR(7500) and hit Return. As with the cassette version, the start line number and increment values both default to 10.

To specify a different starting line number and increment value, just insert both parameters into the USR statement. For example in the casette version X=USR(1800,100,5) or in the disc version X=USR(7500,100,5) will renumber the Basic program starting at line 100 and going up in increments of 5.

A few error-trapping facilities are built into the routine. If there is no Basic program in memory, or if the USR statement contains the wrong number of parameters, the routine hands control straight back to Basic, and a beep indicates a setting-up error.

This also happens if you choose parameters which would generate line numbers greater than 32767.

If all is well, the routine starts by checking every embedded line reference, to see that they all refer to lines which actually exist. If it finds an error, it prints the message "Non-existent line reference at ", followed by the number of the line containing the fault, then exits to Basic without renumbering anything. This is particularly useful when your program is in the development stage.

If there are no errors, renumbering will take place. There's one type of line reference which, though legal, could cause problems in your renumbered program. This is the kind that uses an expression instead of a real number – for example GOSUB N+100. In this case the values of these expressions will need to be recalculated to suit the new line numbers.

The routine helps by printing "Non-numeric line reference at ", followed by the new number of any line containing this type of expression. You can then easily list each offending line and modify the expressions appropriately. If the statement contains both a numeric and a non-numeric reference, such as LIST 10,N*100, the numeric part (10) is renumbered but the expression part is flagged as above, and any numbers in it remain unchanged.

Once the renumber routine is in memory it will stay there until you switch off the power, but Basic can't see it. This means that you can Load, Run, Save and modify Basic programs as though the routine wasn't there.

Bear in mind, though, that the cassette version occupies ram from \$6FB to \$A06 (1787 to 2566), while the disc version lives at \$1D10 to \$202E (7440 to 8238). If your Basic program uses these areas to store things like player-missile maps or new character sets, you can still renumber it, but don't try to Run it while Renumber is in memory.

Program I: The cassette version

```
10 BFR=(PEEK(106)-24)*256:REM reserve
a safe area at the top of RAM as a tem
porary buffer
20 FOR X=0 TO 46:READ D:POKE 1536+X,D:
NEXT X:REM Load the Autoboot creator p
rogram into page 6
30 DATA 104,104,133,204,104,133,203,10
4,133,206,104,133,205,162,16,169,11,15
7,66,3
40 DATA 165,203,157,68,3,165,204,157,6
9,3,165,205,157,72,3,165,206,157,73,3
50 DATA 32,86,228,96,67,58,155
60 REM Load the program temporarily in
to the reserved buffer space
70 X=0:RESTORE 140
80 READ D:IF D=-1 THEN 110
90 POKE BFR+X,D:X=X+1:GOTO 80
100 REM Now read the data from the tem
porary buffer into an Autoboot cassett
e file
110 OPEN #1,8,128,"C:"
120 X=USR(1536,BFR,PEEK(BFR+1)*128)
130 END
140 DATA 0,7,251,6,11,7,169,60,141,2,2
11,24,96,76,22,7,169,6,141,231
150 DATA 2,169,10,141,232,2,96,169,0,1
41,3,10,141,252,9,104,240,16,170,201
160 DATA 2,240,26,104,104,202,208,251,
169,253,32,180,9,96,169,10,141,1,10,14
1
170 DATA 254,9,169,0,141,2,10,240,13,1
04,141,2,10,104,141,1,10,104,104,141
180 DATA 254,9,169,128,133,213,169,0,1
33,212,32,182,8,173,251,9,16,3,76,43
190 DATA 7,32,95,9,32,70,9,16,3,76,43,
7,172,249,9,177,205,141,248,9
200 DATA 140,249,9,162,8,189,111,8,205
,248,9,240,11,202,208,245,32,47,9,16
210 DATA 227,76,120,8,173,248,9,201,30
,208,8,200,200,140,249,9,76,180,7,201
220 DATA 7,208,22,172,5,10,136,177,205
,201,27,208,3,76,131,7,173,5,10,56
```

Turn to Page 14 ▶

```
230 DATA 233,9,141,249,9,172,249,9,200
,177,205,201,14,240,76,201,20,240,193,
201
240 DATA 22,240,189,173,3,10,240,41,16
2,218,160,9,32,149,9,162,229,160,9,32
250 DATA 149,9,160,0,177,205,133,212,2
00,177,205,133,213,32,182,8,173,250,9,
133
260 DATA 212,173,251,9,133,213,32,130,
9,172,249,9,200,200,177,205,201,18,240
,63
270 DATA 201,20,240,4,201,22,208,241,7
6,131,7,200,140,249,9,32,15,9,32,210
280 DATA 217,32,182,8,176,43,173,250,9
,133,212,173,251,9,133,213,32,170,217,
173
290 DATA 3,10,208,10,173,249,9,24,105,
6,168,76,56,8,32,31,9,177,205,201
300 DATA 18,208,29,140,249,9,76,180,7,
238,252,9,162,211,160,9,32,149,9,162
310 DATA 229,160,9,32,149,9,32,119,9,7
6,131,7,201,20,240,12,201,22,240,8
320 DATA 173,3,10,208,3,76,198,7,76,13
1,7,96,0,4,13,35,30,7,11,12
330 DATA 10,173,3,10,208,12,173,252,9,
240,1,96,238,3,10,76,96,7,32,95
340 DATA 9,160,2,32,82,9,48,219,173,2,
10,145,205,136,173,1,10,145,205,173
350 DATA 1,10,24,109,254,9,141,1,10,17
3,2,10,105,0,141,2,10,32,104,9
360 DATA 16,215,96,173,1,10,141,250,9,
173,2,10,141,251,9,165,136,133,203,165
370 DATA 137,133,204,160,2,177,203,141
,255,9,136,177,203,48,53,197,213,240,5
,176
380 DATA 47,76,232,8,136,177,203,197,2
12,240,39,176,35,165,203,24,109,255,9,
133
390 DATA 203,165,204,105,0,133,204,173
,250,9,24,109,254,9,141,250,9,173,251,
9
400 DATA 105,0,141,251,9,76,202,8,56,9
6,24,96,172,249,9,162,0,177,205,149
410 DATA 212,200,232,224,6,208,246,96,
172,249,9,162,0,181,212,145,205,200,23
2,224
420 DATA 6,208,246,96,172,5,10,204,0,1
0,240,12,177,205,141,5,10,200,140,249
430 DATA 9,76,90,9,32,104,9,160,4,140,
249,9,136,177,205,141,5,10,136,177
```

Get it right!

LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
10	21121	20	21859	30	12019
40	10982	50	4362	60	17536
70	2893	80	4314	90	5004
100	21671	110	3015	120	5780
130	836	140	9905	150	10509
160	11053	170	10526	180	10702
190	9738	200	10698	210	10695
220	10330	230	11320	240	10759
250	11441	260	11302	270	10556
280	11384	290	10246	300	10761
310	10301	320	9182	330	9863
340	10550	350	9737	360	10849
370	11496	380	11508	390	11000
400	10702	410	11526	420	10622
430	10461	440	11848	450	11307
460	12085	470	10939	480	10040
490	10172	500	11347	510	12040
520	3976				

```
440 DATA 205,141,0,10,136,177,205,160,
1,177,205,96,165,136,133,205,165,137,1
33,206
450 DATA 96,165,205,24,109,0,10,133,20
5,165,206,105,0,133,206,96,160,0,177,2
05
460 DATA 133,212,200,177,205,133,213,3
2,170,217,32,230,216,166,243,164,244,3
2,149,9
470 DATA 169,155,32,180,9,96,134,207,1
32,208,160,0,140,4,10,172,4,10,177,207
480 DATA 48,9,32,180,9,238,4,10,76,158
,9,41,127,32,180,9,96,141,253,9
490 DATA 169,11,141,66,3,169,253,141,6
8,3,169,9,141,69,3,162,1,142,72,3
500 DATA 202,142,73,3,32,86,228,96,85,
110,107,110,111,119,238,78,111,110,45,
110
510 DATA 117,109,101,114,105,227,32,10
8,105,110,101,32,114,101,102,101,114,1
01,110,99
520 DATA 101,32,97,116,160,-1
```

Program II: The disc version

```
10 OPEN #1,8,0,"D:AUTORUN.SYS"
20 X=0
30 READ D:IF D=-1 THEN END
40 PUT #1,D:GOTO 30
50 DATA 255,255,16,29,50,29
60 DATA 165,12,141,38,29,165,13,141,39
,29,169,37,133,12,169,29,133,13,76,40
70 DATA 29,32,50,29,169,46,141,231,2,1
69,32,141,232,2,96,76,29,45,32,169
80 DATA 0,141,62,29,141,55,29,104,240,
16,170,201,2,240,26,104,104,202,208,25
1
90 DATA 169,253,32,234,31,96,169,10,14
1,60,29,141,57,29,169,0,141,61,29,240
100 DATA 13,104,141,61,29,104,141,60,2
9,104,104,141,57,29,169,128,133,213,16
9,0
110 DATA 133,212,32,236,30,173,54,29,1
6,3,76,97,29,32,149,31,32,124,31,16
120 DATA 3,76,97,29,172,52,29,177,205,
141,51,29,140,52,29,162,8,189,165,30
130 DATA 205,51,29,240,11,202,208,245,
32,101,31,16,227,76,174,30,173,51,29,2
01
140 DATA 30,208,8,200,200,140,52,29,76
,234,29,201,7,208,22,172,64,29,136,177
150 DATA 205,201,27,208,3,76,185,29,17
3,64,29,56,233,9,141,52,29,172,52,29
160 DATA 200,177,205,201,14,240,76,201
,20,240,193,201,22,240,189,173,62,29,2
40,41
170 DATA 162,16,160,32,32,203,31,162,2
7,160,32,32,203,31,160,0,177,205,133,2
12
180 DATA 200,177,205,133,213,32,236,30
,173,53,29,133,212,173,54,29,133,213,3
2,184
190 DATA 31,172,52,29,200,200,177,205,
201,18,240,63,201,20,240,4,201,22,208,
241
200 DATA 76,185,29,200,140,52,29,32,69
,31,32,210,217,32,236,30,176,43,173,53
210 DATA 29,133,212,173,54,29,133,213,
32,170,217,173,62,29,208,10,173,52,29,
24
220 DATA 105,6,168,76,110,30,32,85,31,
177,205,201,18,208,29,140,52,29,76,234
230 DATA 29,238,55,29,162,9,160,32,32,
203,31,162,27,160,32,32,203,31,32,173
240 DATA 31,76,185,29,201,20,240,12,20
1,22,240,8,173,62,29,208,3,76,252,29
250 DATA 76,185,29,96,0,4,13,35,30,7,1
1,12,10,173,62,29,208,12,173,55
260 DATA 29,240,1,96,238,62,29,76,150,
29,32,149,31,160,2,32,136,31,48,219
270 DATA 173,61,29,145,205,136,173,60,
29,145,205,173,60,29,24,109,57,29,141,
60
280 DATA 29,173,61,29,105,0,141,61,29,
32,158,31,16,215,96,173,60,29,141,53
290 DATA 29,173,61,29,141,54,29,165,13
6,133,203,165,137,133,204,160,2,177,20
3,141
300 DATA 58,29,136,177,203,48,53,197,2
13,240,5,176,47,76,30,31,136,177,203,1
97
310 DATA 212,240,39,176,35,165,203,24,
109,58,29,133,203,165,204,105,0,133,20
4,173
320 DATA 53,29,24,109,57,29,141,53,29,
173,54,29,105,0,141,54,29,76,0,31
330 DATA 56,96,24,96,172,52,29,162,0,1
77,205,149,212,200,232,224,6,208,246,9
6
340 DATA 172,52,29,162,0,181,212,145,2
05,200,232,224,6,208,246,96,172,64,29,
204
350 DATA 59,29,240,12,177,205,141,64,2
9,200,140,52,29,76,144,31,32,158,31,16
0
360 DATA 4,140,52,29,136,177,205,141,6
4,29,136,177,205,141,59,29,136,177,205
,160
370 DATA 1,177,205,96,165,136,133,205,
165,137,133,206,96,165,205,24,109,59,2
9,133
380 DATA 205,165,206,105,0,133,206,96,
160,0,177,205,133,212,200,177,205,133,
213,32
390 DATA 170,217,32,230,216,166,243,16
4,244,32,203,31,169,155,32,234,31,96,1
34,207
400 DATA 132,208,160,0,140,63,29,172,6
3,29,177,207,48,9,32,234,31,238,63,29
410 DATA 76,212,31,41,127,32,234,31,96
,141,56,29,169,11,141,66,3,169,56,141
420 DATA 68,3,169,29,141,69,3,162,1,14
2,72,3,202,142,73,3,32,86,228,96
430 DATA 85,110,107,110,111,119,238,78
,111,110,45,110,117,109,101,114,105,22
7,32,108
440 DATA 105,110,101,32,114,101,102,10
1,114,101,110,99,101,32,97,116,160,224
,2,225
450 DATA 2,16,29,-1
```

Get it right!

LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
10	5165	20	583	30	4681
40	2874	50	3989	60	10957
70	10656	80	11232	90	10977
100	11351	110	10627	120	10790
130	11290	140	10901	150	10737
160	11588	170	11202	180	11593
190	11295	200	10931	210	11403
220	10899	230	10711	240	10650
250	9879	260	10649	270	11417
280	10636	290	11657	300	11434
310	11617	320	10164	330	11142
340	11406	350	11067	360	11546
370	11687	380	11713	390	11906
400	10755	410	10834	420	10061
430	12025	440	11710	450	2519

There's so much more to mail merge

LOUISE COLINSON explores the capabilities of Mini Office II

I HAVE found Mini Office II a most useful addition to my micro. However as I only use it at home, I felt that some of the more powerful features would be of little use to me, so I never tried them.

Of course I use both the word processor and communications modules frequently, and the database spreadsheet and graphics present data in a form that impresses friends and colleagues. However the label printer program and the mail merge facility never seemed to be of any use to a home user like me. How wrong I was.

When I heard of proposals to change the structure of local schools I decided to write to several local councillors expressing my concern. At last I had a chance to put the Mini Office II mail merge facility and label printer to real use.

Talk about hiding your light under a bushel. The manual just skims the surface of the topic, which is a pity because it couldn't be easier. For those of you tempted to try it here's how it's done.

The first task is to set up a database of the names you want to write to. I assume that you have read the Data Protection Act and are registered if necessary – mind you if you understand its complexities you'll find mail merging a doddle.

For those new to databases there are three terms you must understand before going any further:

- File: All the names and addresses that you are using.
- Record: One of those names and addresses
- Field: One part of a name and address, such as the surname.

After deciding on the format of your records you edit the structure of the database to make it similar to Figure I. Note that three fields are used for the full name – title, initials and surname. This is so that when you merge the database into the word processor you can use the full name – Mr J. Smith – or part of the name – Mr Smith – by using the appropriate fields.

Once you have edited the structure it is a good idea to save the database with no records entered, so that the structure can be used for other applications. You then enter the names, using edit records, and when you have entered them all save the database under, say, the filename "names". If you are entering a lot of names it would be wise to save every few entries.

You can easily print the names from the database but now I have discovered how easy and flexible it is to use the word processor I doubt if I'll use the database printout routines for anything except a quick viewing of what I have typed in.

To print database files from the word processor you use the embedded command FL. Embedded commands are instructions to the micro to do something, but they do not appear when the actual text is printed out.

You enter them by pressing the inverse video key before and after each command. They should then show highlighted on the screen. Each should be followed by a space to indicate the end of the command.

FL is an abbreviation of FieLd and is followed by its number. So to do a mail merge you use FL several times throughout the text and ask for several copies of the letter. As the first is printed you will be prompted for the name of the file to use and the first

Turn to Page 16 ▶

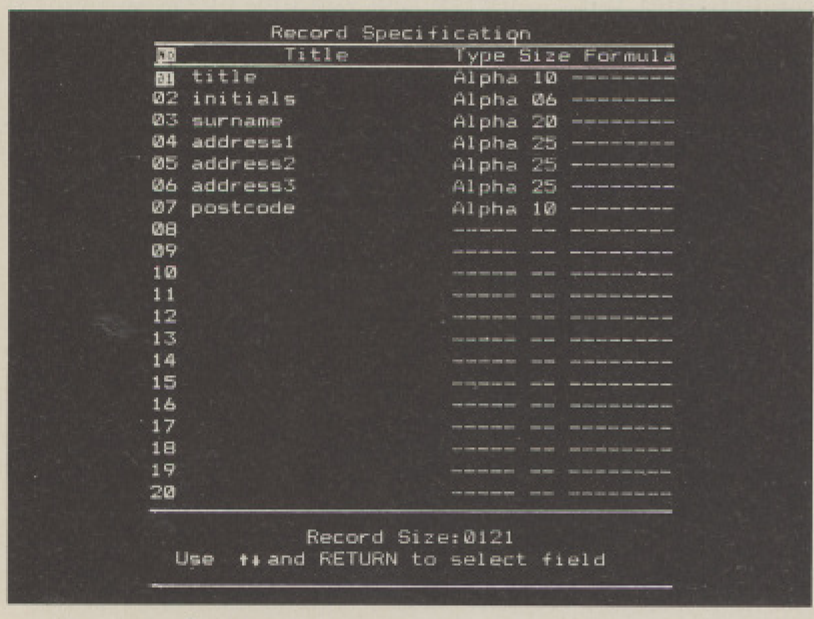


Figure I: The new database structure

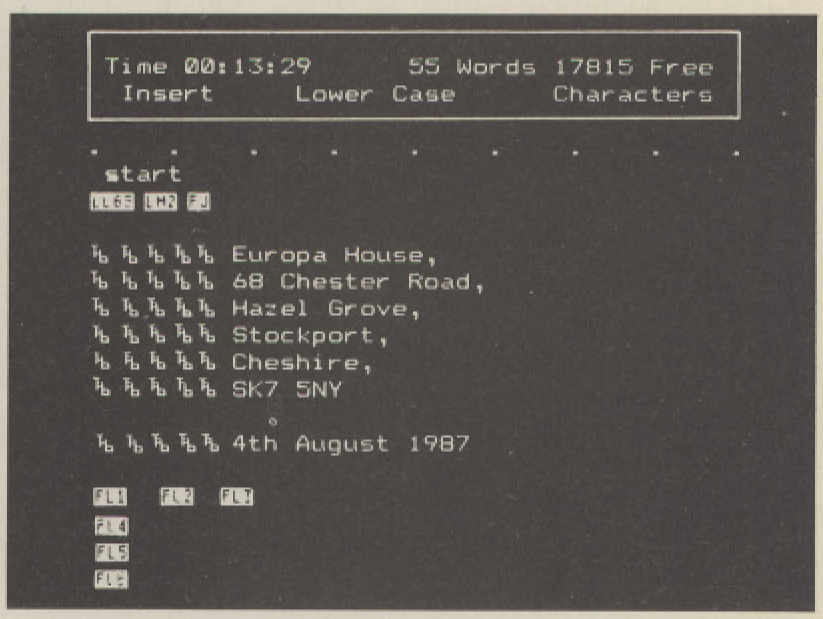


Figure II: The start of the letter

record of the database specified is used. FL1 wil print the first field of the first record, FL2 the second field and so on.

When the letter has printed, provided you have asked for more than one copy a second will be printed using information from the same database file. This time the FL commands will print the appropriate fields from the second record.

Let's start by printing a list of the names – just enter the edit mode of the word processor and type the following, ending with Return:

FL1 FL2 FL3

Press Escape to return to the word processor menu. Make sure you're now using the disc containing the file of names, then select Print Text.

At the first sub-menu – Print Options – just press Return to select Print Text. You will then be asked how many copies you require. Suppose you have 30 names in your list answer 30 to this question. If you are not sure how many names there are in your file, just enter a large number such as 500 and printing will stop when all the records in the file have been printed.

Now that you have discovered how easy it is to print a list of names from the database file using the word processor, printing letters to all the people in your file is a very small step. Type in the letter as shown by the two screens of Figures II and III. Remember that the letters highlighted are embedded commands, and to get these just press the inverse video key before and after the command.

You'll notice that there are five tabs (each followed by a space) in front of the address lines. As the initial settings for tabs are 10, 20, 30, 40, 50 this causes the address to start at the 50th character space along the line.

We have already discussed the embedded command FL. To make producing a tidy letter very easy Figures II and III use several others. Here is what they do:

LL65 sets the line length to 65

LM12 set the left margin to 12. This means that the printout, with line length 65 and paper width 80, will be approximately central.

FJ sets full justification, so the letter will be evenly spaced between the left and right margins.

FL1 prints field 1 of the present record,

FL2 prints field 2 and so on.

Once you have typed in your letter save it, and then print out several copies by following the same steps you used to print out the list of names.

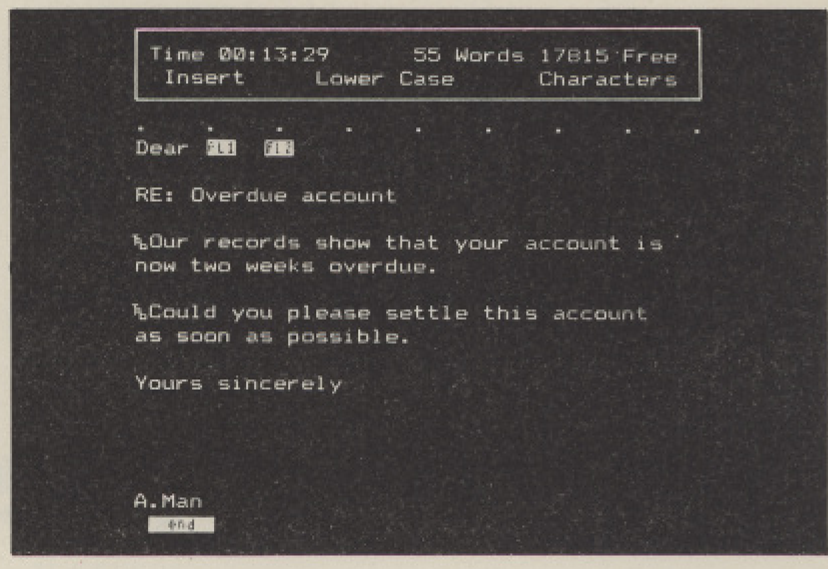


Figure III: The end of the letter

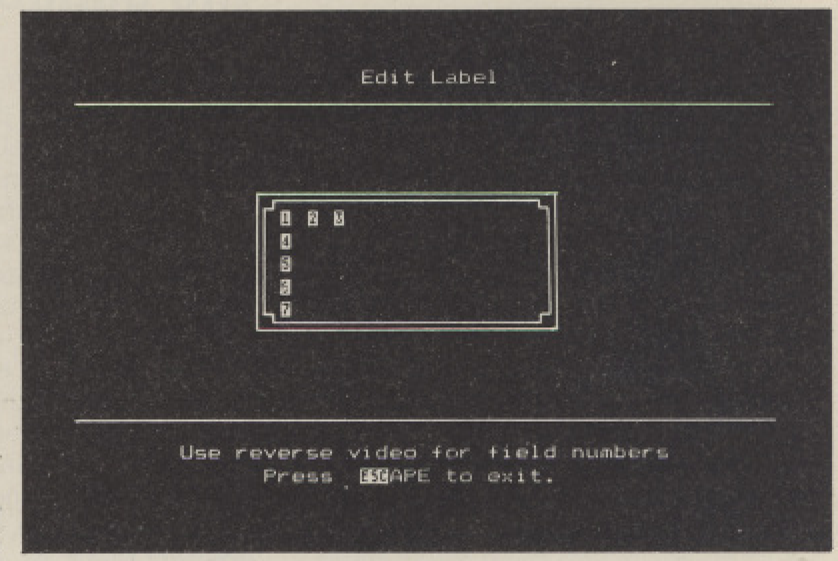


Figure IV: Label Printer Edit screen

Now your letters are printed you need envelopes addressing. The ideal way is to feed your database file into the Label Printer. Load the Label Printer program into your micro and load the database file using the Load File option. Select Edit Format from the Label Printer menu, and then set up number of labels across the page and any other variables that you want to change from the Edit Format menu. Once these are set select Edit Label.

In the Label Printer Edit mode fields are represented by a number in inverse video. Edit your label to look like Figure IV, then press Escape twice to return to the Label Printer menu.

Select Print Labels and, from the menu, choose the Test Print option. This will show you the position of the printout and give you a chance to move the paper if necessary. Keep doing test prints until you are satisfied with the printout's position.

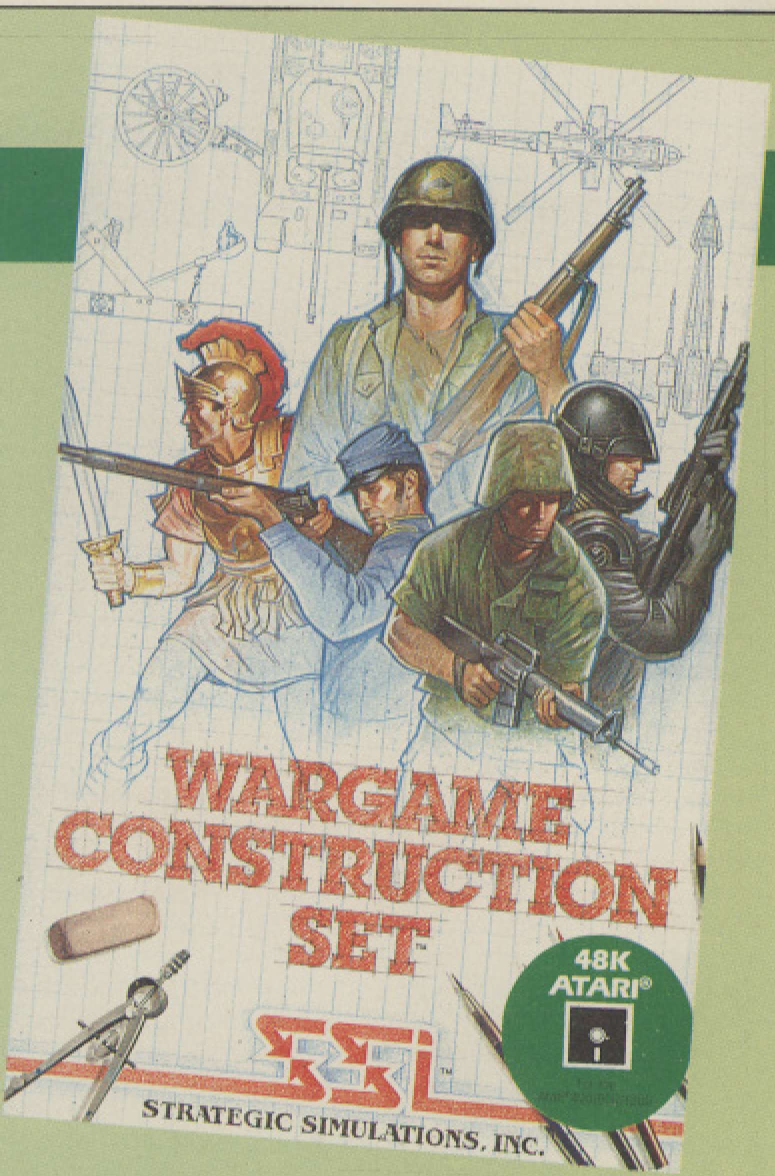
You will notice that the number of labels will have been set automatically to the number of addresses in the file you loaded. If you want two labels for each address just double this number. You then select Print Labels and they will print.

Don't let the fact that this feature of the word processor is called mail merge fool you into thinking that just because you have no letter to send you can't use it. It is a far more powerful printout option for the database than the in-built one, allowing neat work even on preprinted forms such as invoices.

Teachers can use it to produce personalised, worksheets for their pupils and hotels can use it to print out several different standard menus – the various print size options of Mini Office II are useful for these applications.

Its possibilities seems endless. If you've come up with an original application – particularly if you have used the mail merge facility for uses other than letters or circulars – write and tell *Atari User*.

Wars for all



Program: Wargame Construction Set
Price: £19.99
Supplier: Strategic Simulations Inc/US Gold, Units 2 & 3, Holford Way, Holford, Birmingham B6 7AX.
Tel: 021-356 3388

WHETHER your taste is for the American Civil War, battles of ancient Rome, or modern warfare, all wargame buffs should be delighted with this one.

As the title indicates, this superbly designed package lets you purpose-build your own battlemaps and scenarios.

There are two programs: The editor and the game. The editor allows you to design your own wargame from scratch or alter an existing one and offers a wide range of options and parameters.

You can construct your battleground map, filling it with a variety of features such as roads, trees, rivers, buildings, minefields, hills and woods. The map colours can be edited to your own tastes.

Up to 31 friendly and 31 enemy units can be selected and placed in position. An individual unit can be chosen up of infantry, tanks, engineers, mortars, guns, special units, boats, helicopters or trucks.

Each can be assigned its own attributes (power) – assault, firepower, defence, movement, strength, range and fire type.

Having designed your scenario, you select the scale, set artillery to on or off and print out the map if you wish. All completed scenarios can be saved and reloaded from disc.

The game program lets you play through any scenario, whether of your own creation or one of the eight ready-to-play battles supplied with the package.

A game can be for one or two and consists of a series of phases. The phases for a one-player game (the enemy is controlled by the computer) have to be played in strict order.

They follow the usual traditions of wargames and are: Observation, friendly fire, friendly move, enemy fire, friendly fire, enemy move, enemy fire, victory and save game. Each complete set of phases is one game turn.

Points are awarded at the victory phase while the save game phase gives you a chance to save the game state to disc. The two-player game has more phases.

The package is attractively boxed and includes two discs and an excellent 30-page manual. A disc contains the editor program on one side and the game program on the other. The second disc has predesigned scenarios on both sides.

Graphics and sound are fairly simple but the program's variety, flexibility and design are marvellous. Although the editor program has a multitude of options and features, it is simple to use and the player is guided at every step.

Wargame Construction Set is an impressive and unusual (possibly unique) product. It has been superbly designed and, though sophisticated, is extremely easy to use. If you've never given wargames a try, now's your chance.

With this product, you could be hooked for life.

Bob Chappell

Sound	*5*
Graphics	*7*
Playability	*10*
Value for money	*9*
Overall	*9*





Great Gauntlet



Program: Gauntlet – the Deeper Dungeons
Price: £4.99 (cass) £6.99 (disc)
Supplier: US Gold, Units 2/3. Holford Way, Holford, Birmingham B6 7AX.
Tel: 021-356 3236

ANYONE out there who doesn't know what Gauntlet is, go to the bottom of the class.

It was originally an arcade game with simultaneous four-player action and proved a great success. Many other companies have used this feature since.

The basic plot is that evil creatures have invaded your land and you, with three other intrepid heroes, venture forth to do battle.

A total of 512 levels of manic battling follow, including hand-to-hand fighting, magic-using, eating, drinking and other mayhem.

All very similar to the arcade original, in which the first seven levels are set. But then the screens are never played in the same order twice. This aspect is carried over to the Atari version.

Now US Gold has released an additional 512 levels of the same mad warfare.

The same rules apply except that now your have to chart unknown territory. Beware of poisoned food and be careful not to shoot potions.

You should collect as many extra abilities as possible and generally kill anything that moves.

I thoroughly enjoyed Gauntlet the first time round, and with this new batch of lunacy anyone who hasn't bought this game should go straight out and buy both Gauntlet and the Deeper Dungeons.

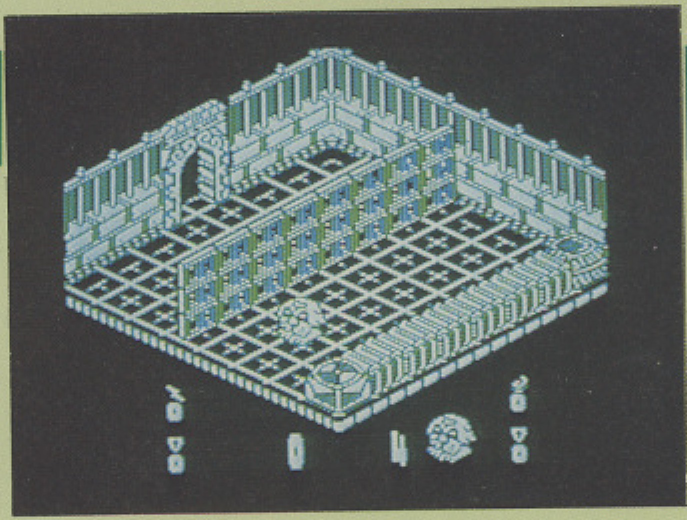
Unfortunately, you do need to buy both as the new levels in Deeper Dungeons will not run without the original.

If anyone wants me I will be down a dungeon...

Robert Swan

Sound	8
Graphics	9
Playability	8
Value for Money	10
Overall	9

Unite to win



Program: Head over Heels
Price: £8.95 (cass) £12.95 (disc)
Supplier: Ocean, 6 Central Street, Manchester M2 5NS.
Tel: 061-832 6633

JON Ritman, who wrote Batman, has now produced Head Over Heels. Although this is another 3D maze runabout, it is quite a different game.

The Blacktooth Empire has been growing steadily for many years, taking over other planets and ruling by oppression.

You now have the opportunity to free these enslaved planets by subverting the Empire and finding the lost crowns. To do this you take control of two agents, Head and Heels from the planet Freedom.

Head is descended from a flying reptile and retains his wings, where Heels has evolved from an animal and has powerful legs but no arms. Both creatures can operate separately but once you unite them they became a powerful adversary.

Your two heroes start the game in separate cells in Blacktooth's castle. The cells are equipped with exercise equipment including a wall ladder which Head must learn to climb.

You must free and unite them in the market place so they can reach Moon base headquarters. From there you can teleport to the planets to search for the missing crowns. All four must be found before you can embark on the final quest.

The first planet in the system is Egyptus, a strange world where civilisation seems to revolve round people wrapping corpses in bandages and placing them in pyramids.

The Penitentiary is the Empire's prison planet, from which few return. It also holds the secret of the Pit.

A densely-vegetated planet known as Safari is the third in the system. Here the natives live in wooden houses and set traps for animals.

The final planet is Book World. This is a huge Western library used only by the Emperor and his minions, who are keen on the old West.

The task before you is not as impossible as at first appears, and you will find several objects to help you.

Teleports sometimes provide the only access to certain rooms, while springs, switches and conveyor belts can help or hinder you.

Magic items and creatures, such as cuddly bunnies, will also help you for a limited time but they do not always have the same effect on both characters.

Joining Head and Heels and picking up a special power will result in both characters obtaining the new ability.

Even if you are not a buyer of 3D games, look at this one – somehow it feels very different from any other game of this type I have played.

Neil Fawcett

Sound	8
Graphics	9
Playability	8
Value for money	8
Overall	8

Dashed difficult



Program: Boulder Dash Construction Set
Price: £9.95 (cass), £14.95 (disc)
Supplier: Databtye, 15 Wolsey Mews, Kentish Town, London NW5 2DX.
Tel: 01-482 1755

BOULDER Dash Construction Set is the ultimate challenge to fans of the relentless Rockford, as well as for newcomers to the rock pushing, critter crushing, diamond collecting world of Boulder Dash.

The hero is the one and only Rockford who must push his way through the dirt and boulders of critter-infested caves to collect the required number of diamonds that will reveal the exit.

There may be as many as 99 diamonds or as few as one but either way you will need your reactions and brain in top gear to solve each cave.

They are packed with such hazards as boulders that fall when you dig out the dirt from under them, fireflies and butterfles that are deadly to the touch. Added to this is a growing amoeba that threatens to swamp the screen.

You will also have to guide Rockford through indestructible walls, expanding walls and walls that turn boulders into diamonds – but you'll have to be quick to collect these.

This is the fourth in the Boulder Dash series and features caves that are fiendishly difficult. The flies and boulders combine to form a few near impossible routes to the exit.

But Boulder Dash IV is only half the story. The other side of the game tape features an easy to use, joystick-controlled, construction set.

By building up caves from the joystick selected components you can create your own Boulder Dash games and make them as challenging as you like by adding hidden doors and extra Rockfords that do nothing except cost you a life if they're destroyed.

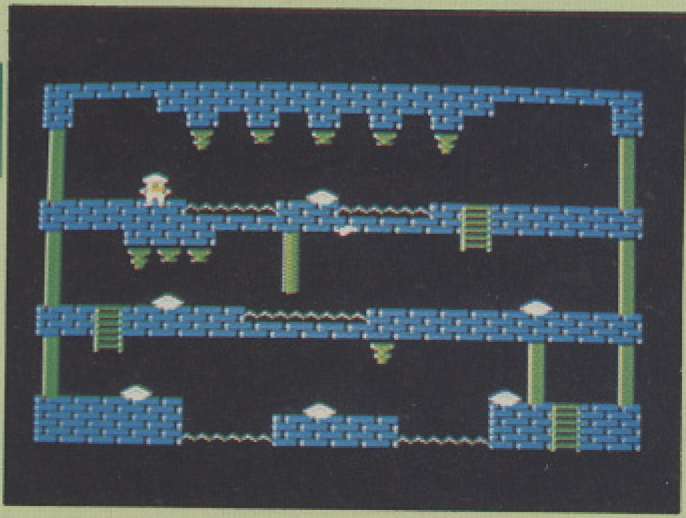
You can then test your creations until you've got the timings and gameplay exactly right before saving your caves to tape or disc.

The antics of Rockford pose a unique mixture of strategy and skill that will challenge both beginners and addicts alike.

Tony Hetherington.

Sound	*6*
Graphics	*5*
Playability	*9*
Value for Money	*8*
Overall	*8*

Nuclear no-no



Program: Joe and the Nuclear Caverns
Price: £3.99 (cassette) £7.99 (disc)
Supplier: STV Software, 9 Chiswick Walk Chelmsley Wood, Birmingham B37 6TA.
Tel: 021-770 1003

THE nuclear power plant at Bizewell is dangerously near to overloading and has to be shut down before the anticipated Big Bang which would reduce the population to 30 million hunks of well done steak.

Fires are raging round the reactor building due to the violent overheating and access is no longer possible.

Someone has to go down there and stabilise the system.

Joe, the Charlton Heston of the nuclear disaster, steps forward – although frankly my vote would be for the Minister for Energy to be the volunteer. The only way in to the reactor core is via a series of tunnels and caverns built under the reactor for just such an emergency.

Defence systems were built in, includeing stalactites and stalagmites, acid pools and laser beams.

Apart from the security measures, the radiation has mutated strange jelly like creatures that creep out of the ground and radioactive birds which will attack anything that moves.

And so Joe sets off in a desperate quest to save us all. I must say with that build up I was surprised that the opening scene was so tame – I felt more threatened in Chuckie Egg.

This is very much a budget game and, for all the scene-setting, a rather unimaginative platform hopping variation. The action is on the slow side, the graphics rather uninspired and to make matters worse, the music is horrendous.

There is no choice in the levels of difficulty, nor are you given the option for two-player mode.

Personally I think it is of rather dubious taste. Of course death and destruction feature strongly among the best of games and, while wholesale slaughter of millions of innocent aliens, gremlins and general nasties can in no way be condoned, overheating nuclear reactors are somehow more disturbing. Gremlins and aliens live in our imaginations, exploding nuclear reactors live not only in our nightmares but the all too recent past.

There is nothing new on offer in Joe and the Nuclear Caverns. The game play itself is OK, but overall loses out for having only the one level of difficulty and no two-player option.

Niels Reynolds

Sound	*5*
Graphics	*6*
Playability	*6*
Value for Money	*5*
Overall	*6*

Addicts' choice

Product: 221B Baker Street
Price: £19.99
Supplier: Datasoft, c/o US Gold, Units 2 & 3, Holford Way, Holford, Birmingham B6 7AX.
Tel: 021-356 3388

THE game is definitely afoot in Baker Street, though whether Dr Watson would consider it elementary is another matter.

Datasoft's interpretation of the Sherlock Holmes stories plunges you straight into smog-bound London, revisiting the scenes of the crimes.

The name of the game is detection: Hunt the clues, find the murderer, name the weapon, identify the motive. But there's a little more to it than that . . .

With joystick (or keyboard if you must) at the ready, select the number of players (1-4) – and note that it's a case of the more the merrier as you can get in each other's way.

To make life complicated, you can then opt to receive your clues in code. Codes are not sacrosanct, and the other players can crack them – but you can always change your code later to throw them off the scent.

Your next task is to select a character – Holmes, Watson, Inspector Lestrade or Irene Adler.

Now all you have to do is select a case to crack from the 30 available (more if you've got the additional library discs) and read the casebook carefully for clues.

At this stage it's as well to have pen and paper to hand otherwise you'll rapidly lose track of what's going on.

Groundwork done, move on to the playing screen, a scrolling map of London with the interesting buildings picked out. This toggles with a "helium-balloon" view of the whole city which reveals your opponents' locations and lets you plan tactics.

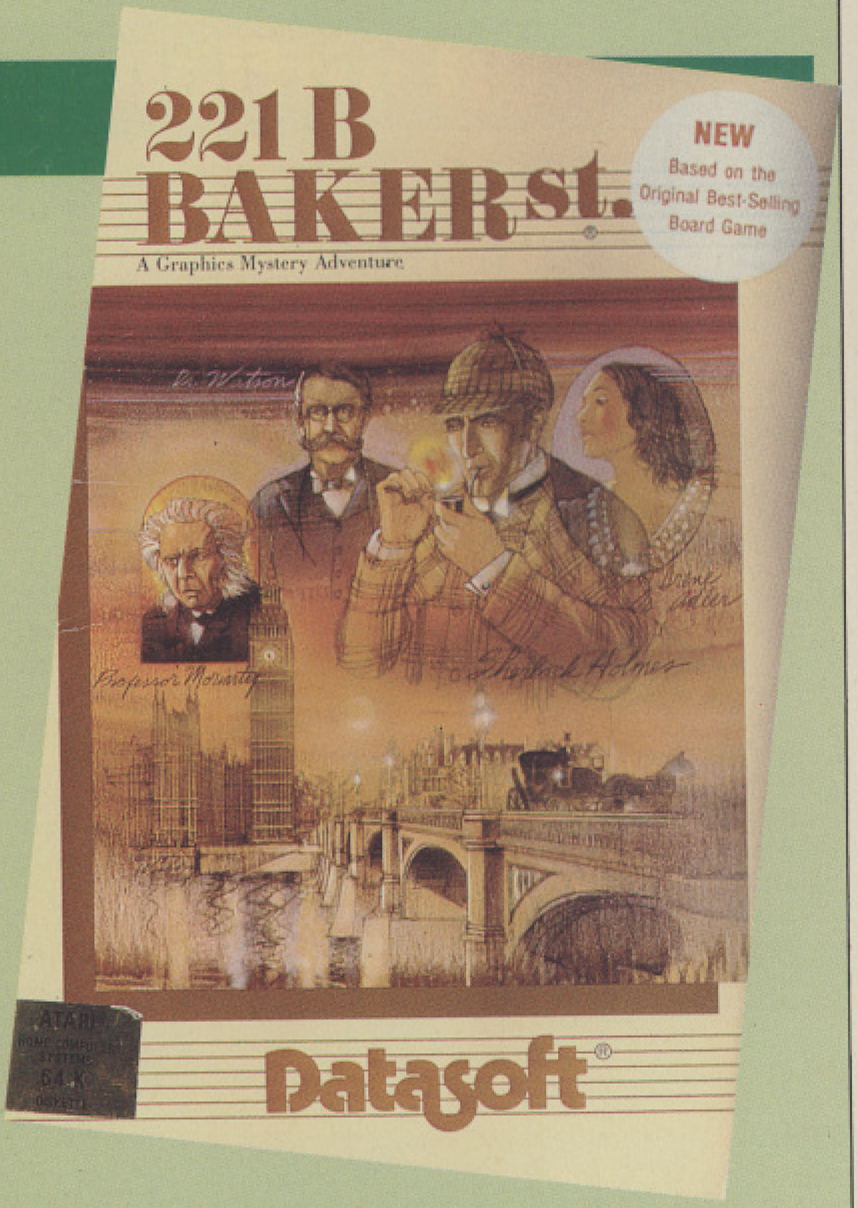
Each building contains a clue or a playing aid: Your job is to do the rounds, collecting as few clues as you need to solve the crime.

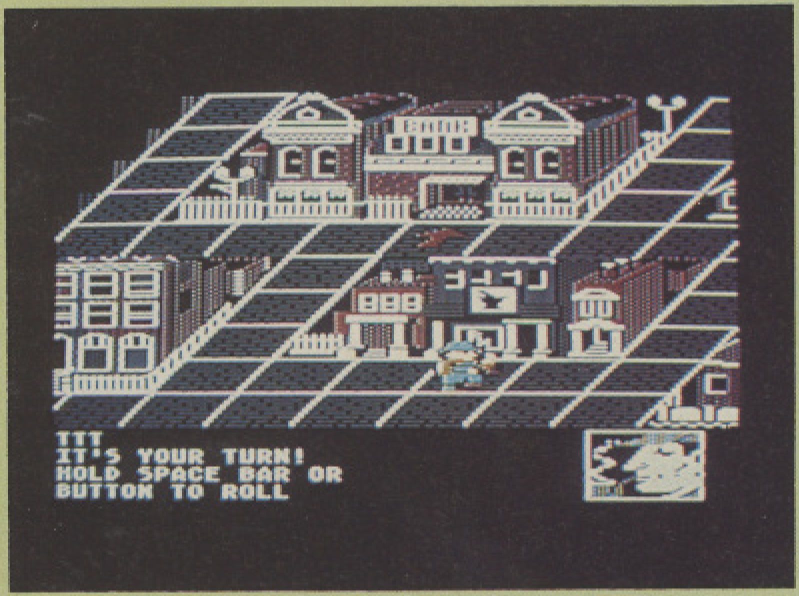
You'll also need to acquire a badge from Scotland Yard en route, otherwise you'll not be able to get back into 221B.

Mission accomplished you head back to Baker Street as quickly as possible – on foot, by cab or even by underground passage – and announce your solution.

Take care in going underground though. The secret passages are fast but unpredictable, dumping you out at random locations.

And if any part of your solution is wrong you'll be back on the streets again – and you won't know where you went wrong either.





The concept is sound enough, but plodding around the streets to get the clues does get tedious.

There are distractions and you can "lock" buildings behind you to make life difficult for the other players.

Bear in mind though that you might need keys on occasions too, when your opponents have beaten you to a location. Still, you can always replenish your supply at the Locksmith's shop.

Speed of movement is determined by an on-screen dice, which is perhaps too faithful a rendition of the original board game – surely something a little more sophisticated could have been contrived.

The sound effects and graphics are competent and colourful but hardly exciting, and the novelty of entering strange buildings soon wears off.

It does help to plan ahead and to choose economical routes between objectives. And strategy of a sort is called for in throwing your opponents off the scent.

But it's a game for Holmes addicts really, for the clues, casebook and quotes all lovingly recreate the atmosphere of the original stories.

As a computer game it doesn't quite stand on its own two feet.

As a mental exercise, or as a board game, with the family clustered round getting in each other's way (intentionally) it works.

Full marks for effort and full marks for translation, but most players will find it does for them what Conan Doyle's dog was remarkable for doing in the night. Nothing.

W.F.Wilberforce

Sound	*6*
Graphics	*8*
Playability	*6*
Value for Money	*6*
Overall	*6*



JAMES BOND 007
IN
THE LIVING DAYLIGHTS
THE COMPUTER GAME
ALBERT R. BROCCOLI
Presents
TIMOTHY DALTON
as IAN FLEMING'S
JAMES BOND 007
THE LIVING DAYLIGHTS
Amstrad CPC/PCW
CBM 64/Amiga
Spectrum 48/128/Plus 2/3
BBC B & Master
Atari 8 Bit
MSX
DOMARK
Starring MARYAM d'ABO JOE DON BAKER ART MALIK and JEROEN KRABBÉ
Production Designer PETER LAMONT Music by JOHN BARRY Associate Producers TOM PEVSNER and BARBARA BROCCOLI
Produced by ALBERT R. BROCCOLI and MICHAEL G. WILSON Directed by JOHN GLEN Screenplay by RICHARD MAIBAUM and MICHAEL G. WILSON
TECHNICOLOR
PANAVISION
DOLBY STEREO
ORIGINAL SOUNDTRACK ALBUM AVAILABLE ON
WARNER BROS. RECORDS, CASSETTES AND COMPACT DISCS
TITLE SONG PERFORMED BY
a-ha
UA
United Artists
Gun Logo Symbol © Danjaq S.A. and United Artists Company 1962 © 1987 Danjaq S.A. and United Artists Company. All Rights Reserved. Distributed by MGM/UA Distribution Co.
© Eon Productions Ltd. Glidrose Publications Ltd. 1987. Published by Domark Ltd., 22 Hartfield Road, London SW19 3TA. Tel: 01-947 5624 Telex: 894475G.

5 LINERS

JOYSTICK DRIVER from Tim Rodgers

IF you've been following Len Golding's series on input/output through the joystick ports or Andre Willey's on CIO, here is the culmination of both ideas allowing you to treat the joystick ports as any other I/O device. And in five lines too.

The device name is J: and the handler is used in the same manner as the other handlers:

```
OPEN #S,N1,N2,"J:"
```

S is the stream number(0–7) and N1 is set to 4 for input, 8 for output or 12 for input/output.

N2 is only significant when N1 is 12 (otherwise a zero should be entered). It is the decimal equivalent of the binary bit pattern for setting the direction of the individual I/O lines so a value of 15 in N2 when N1 is 12 will set lines 0,1,2,3 to output and lines 4,5,6,7 to input (the bits in N2 are set to make the equivalent line output and reset to make the line input).

COMMANDS

PUT #S,X Sends the byte X to the port.
GET #S,X Gets the byte from the port and store it in the variable X.
CLOSE #S Closes stream S.

You must agree that this is much easier than trying to remember all those peeks and pokes. Remember to save this program before running as it erases itself when run.

Basic Program

```
1 FOR I=1536 TO 1649:READ D:POKE I,D:N
EXT I:L=USR(1536):NEW
2 DATA 104,162,0,189,26,3,240,10,232,2
32,224,36,176,3,76,3,6,0,169,74,157,26
,3,232,169,36,157,26,3,232,169,6,157
3 DATA 26,3,96,50,6,95,6,104,6,98,6,11
0,6,110,6,76,85,6,165,42,201,12,240,11
,201,8,240,25,201,4,240,26,160,146,96
4 DATA 166,43,169,56,141,2,211,142,0,2
11,169,60,141,2,211,160,1,96,162,255,7
6,70,6,162,0,76,70,6,76,91,6,141,0
5 DATA 211,76,83,6,173,0,211,76,83,6,1
60,146,96
```

Assembler

```
        ;SYSTEM EQUATES

        ORG $600
ZIOC1   EQU $2A
ZIOC2   EQU $2B
BOOT    EQU $9
PACTL   EQU $D302
PORTA   EQU $D300

        ;CONSTRUCT HABTABS ENTRY
        ;FIRST FIND ROOM IN TABLE

        PLA
JINIT   LDX #0
NEXTENT LDA $31A,X
        BEQ TABENT
        INX
        INX
        CPX #36
        BCS NOROOM
        JMP NEXTENT
NOROOM  BRK

        ;NOW TO PUT THE ENTRY IN

TABENT  LDA #'J'
        STA $31A,X
        INX
        LDA #LOW JDRIVER
        STA $31A,X
        INX
        LDA #HIGH JDRIVER
        STA $31A,X
        RTS

        ;NOW CONSTRUCT THE VECTOR
        ;TABLE

JDRIVER DW OPEN-1
        DW CLOSE-1
        DW GET-1
        DW PUT-1
        DW STATUS-1
        DW SPEC-1
        JMP INIT

        ;NOW THE ACTUAL ROUTINES

OPEN    LDA ZIOC1
        CMP #12
        BEQ IOOP
        CMP #8
        BEQ OPOP
        CMP #4
        BEQ IPOP
        LDY #146
        RTS

        ;OPEN FOR I/O

IOOP    LDX ZIOC2
PATCH   LDA #$38
        STA PACTL
        STX PORTA
        LDA #$3C
        STA PACTL
OK      LDY #1
INIT    RTS

        ;OPEN FOR O/P ONLY

OPOP    LDX #$FF
        JMP PATCH

        ;OPEN FOR I/P ONLY

IPOP    LDX #$0
        JMP PATCH

        ;NORMAL STATE OF THE PORT
        ;IS FOR INPUT, SO.......

CLOSE   JMP IPOP

        ;PUT A BYTE TO PORT

PUT     STA PORTA
        JMP OK

        ;GET A BYTE FROM PORT

GET     LDA PORTA
        JMP OK

        ;THESE FUNCTIONS NOT
        ;IMPLEMENTED

STATUS
SPEC    LDY #146
        RTS
        END
```

Get it right!

LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
1	10645	2	16707	3	16526
4	16287	5	7027		

IF you've written any useful or interesting five line programs why not send them to us to grace our pages?

You should give a full description of the routine and any other details that are relevant.

If you want your material returning please enclose a suitably stamped package.

We pay £25 for each one published.

Win £25

Simply send a copy of the program on disc or tape together with the documentation – preferably as a word processed file – to:

Atari User, Europa House, 68 Chester Road, Hazel Grove, Stockport, SK7 5NY.

CODE LOADER from Hassan Mehmet

THIS program solves the problem of many programmers concerning the Assembler Editor and attempting to CLOAD object listings that they have created.

The manual says that an object listing of your machine code can be loaded into Basic. But when you do this a file error occurs and trying to ENTER"C:" does not help. When you peek the location where your code is meant to be stored there is nothing there.

When you use the Assembler Editor cartridge, save your program in the normal object listing way:

```
SAVE #C:FILENAME <address 1,
  address 2>
```

Then to load your object listing into Basic simply run the five line program and it should do the trick. Once you have the object code in memory you can turn it into machine code strings or data statements using a data making routine.

PROGRAM BREAKDOWN

10 – Sets a trap in case of an error and prompts the user, then opens the cassette port and clears the first two bytes.
20 – Gets two bytes into D and I, and calculates start and end address. Assigns start to the location to start poking to ADDR.
30 – Gets a byte and pokes it into start location onwards and checks to see if there are any more bytes to read.
40 – Goes to 20.
50 Checks if an error occurred while loading or if finished, closes file.

```
10 TRAP 50:? "PRESS PLAY ON TAPE AND H
IT (RETURN)":OPEN #3,4,0,"C:":GET #3,D
:GET #3,D
20 GET #3,D:GET #3,1:STAD=1*256+D:GET
#3,D:GET #3,1:EDAD=1*256+D:ADDR=STAD
30 GET #3,D:POKE ADDR,D:ADDR=ADDR+1:IF
 ADDR<=EDAD THEN 30
40 GOTO 20
50 IF PEEK(ADDR-2)=0 THEN ? "ERROR!!!
PLEASE TRY AGAIN":CLOSE #3:END
```

Get it right!

LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
10	14857	20	12941	30	10174
40	1418	50	12106		

RAMDOS from Paul Cracknell

THIS program is a utility to cut the time taken for Dos 2/2.5 to load from Basic after the Dos command. It can be particularly annoying if you only want to read a disc directory.

Very little is seen of this program, which remains on the disc as an AUTORUN.SYS file and therefore automatically executes on power up.

The ready prompt appears and Basic programming may proceed as usual. When the Dos command is first typed, the Disc Utilities Package is loaded and the menu appears as expected.

The Atari's MEMLO pointer has been moved up in memory, thus protecting Dup. So all its functions may be carried out as normal. Returning to Basic is easy and, up to now, you will not have realised that Ramdos is present.

On the next and all subsequent Dos calls, however Dup appears instantly. And when you return to Basic your program will still be present if you hit System Reset prior to the Dos call.

If you fail to do this the program will be deleted as normal. If you remember to hit the reset key Ramdos makes MEM.SAV pointless and so it does not have a MEM.SAV feature.

The program will automatically set the disc drive to write without verify so it writes faster and this does not usually result in faulty saves.

To create a Ramdos disc you must load the Basic program, then insert a disc that has Dos and Dup present but without any AUTORUN.SYS file on it. You can now run the Basic program and an AUTORUN.SYS file will be created. The disc will then auto boot on power up and set up Ramdos. This works with Dos 2.5 while programming in Basic or Assembler Editor and will function with most rom-based languages.

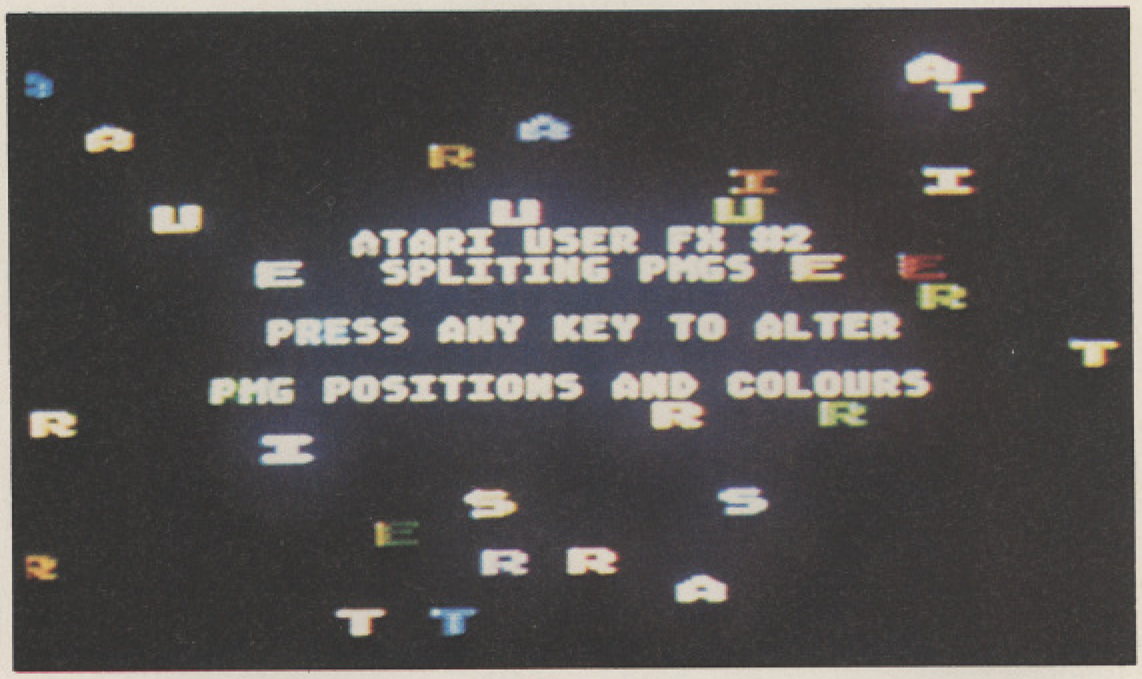
PROGRAM BREAKDOWN

10 – Restores data, prints a message and opens a file on the disc.
20 – Reads data and places it on the disc.
30 – closes and locks the disc file before the program ends.
40 to 50 – Machine code data.

```
10 GRAPHICS 0:? :? :? :? "Writing Auto
run file to disk......":RESTORE 40:OPE
N #1,8,0,"D:AUTORUN.SYS"
20 READ X:IF X<>-1 THEN PUT #1,X:GOTO
20
30 CLOSE #1:XIO 35,#1,0,0,"D:AUTORUN.S
YS":END
40 DATA 255,255,204,6,255,6,32,64,21,1
69,239,133,10,169,6,133,11,169,6,133,1
3,169,204,133,12,169,51,141,232,2,169
50 DATA 6,141,231,2,169,80,141,121,7,9
6,173,255,6,201,0,240,3,76,117,32,238,
255,6,76,159,23,0,224,2,225,2,207,6,-1
```

Get it right!

LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
10	19965	20	7337	30	7663
40	16556	50	16523		



SPECIAL FX

More amazing effects on your micro from RICHARD VANNER

HERE'S a program that allows up to 80 players on the screen. Yes, that's right, 80.

In last month's FX program you'll notice that the routine limited you to four bent sprites and no other processing time was available. Let's move on to setting up a Display List Interrupt that will do all the work, and leave your Basic program free to do other jobs.

A Display List Interrupt (DLI) will interrupt the processor flow for a few microseconds at any display line that has the DLI bit set. It allows you to do small routines like sound, graphics or counters.

This information is set up in the Display List, which describes the type of mode lines that make up the display and also tells the Antic chip where to fetch data that is to be displayed to the screen a function unique to the 8 bit Atari.

It can also set any line for fine scrolling and set a line to indicate where a DLI is to take place. This is the function we need.

If for example, we want a colour change DLI to occur half way down the screen, we would first find the Display List. It can be found via the pointer at SDLSTL 560-561 ($0230-$0231). We would then add 128 to the mode byte in the display list which described the middle line.

Next we tell Antic about the DLI and where it is. Changing pointer VDSLST 512-513 ($0200-$0201) to the DLI start address will set the non maskable interrupt vector (tell ANTIC where your DLI is). Then all you have to do is set the DLI bit in NMIEN 54286 ($D40E).

The bit number that enables DLIs is bit 7 (128 $80). Also remember to keep the VBI (Vertical Blank Interrupt) enabled. To do this we add bit 6 (64 $40) to our 128 value to give 192 ($C0). Poking this into NMEIN informs Antic that both VBI & DLI interrupts are enabled.

Now that you can see how a DLI is set up and left to run, we shall see how these DLI routines can enhance programs and save programmers the fuss of keeping things running themselves.

Program I is an assembly listing and Program II the Basic listing that sets up a Display List Interrupt to split the four player graphics in equal lengths down the screen. Each new section of the players has its own new X position and colour. **Table I** gives a breakdown of the Basic program showing how it sets up the routine and **Table II** is a detailed account of the assembly listing.

Notice that although the Y register is saved and restored it isn't changed in any way during the DLI. This may seem strange, but if the routine is

160	Sets up the string sizes.
180 to 210	Copies a machine code routine into A$ and calls it via the X=USR(ADR(A$)) command. This routine places random numbers into the sprite X position and colour tables.
230 to 240	Lowers memtop so as to make room for the 1k of PMG data.
260 to 280	Locates the Display List from locations 560 and 561 and then alters the bytes that describe the mode types to allow for Display List Interrupts. Twenty lines in all are set for interrupt.
300 to 390	Set up PMG system variables and clear all player ram.
410 to 440	Pokes in the character data for "ATARI USER" down each player, you can change this to cars, aliens or whatever you need.
450 to 540	The data for the "ATARI USER" lettering.
560 to 590	Copies the Display List Interrupt routine into page 6 (1536 $0600). This is a safe page of ram (256 bytes in a page).
610	Sets player widths
630 to 660	Prints up a small message.
690	Will set the DLI off and running, it first tells Antic the address by poking the low and high bytes of $0600 into 560 and 561. Remember LOW byte first then HIGH byte. NMEIN is then set to 192 and the DLI will run.
710	Gets a key and calls the random number routine stored in A$ which resets the X positions and colours of the players. This shows that Basic can continue while the DLI is enabled.
720 to 740	Data for the random number routine.
750 to 770	Holds data for the DLI.

Table I: The Basic program breakdown

changed and the Y register used without updating the start and end of the DLI, the system will crash.

So take it from me its good programming practice to push all registers.

You can use this routine now to animate 80 sprites but remember that only four can be on one line at a time. You can also change lines 750 to 770 to read the following for extra speed:

```
750 DATA 120,72,152,72,138,72,166,208
,224,20,208,4,162,0,134,208,189,90,6,
141,0,208,189,170,6
760 DATA 141,18,208,189,110,6,141,1,2
08,189,190,6,141,19,208,189,130,6,141
,2,208,189,210,6,141
770 DATA 20,208,189,150,6,141,3,208,1
89,230,6,141,21,208,230,208,254,90,6,
254,110,6,254,110,6
780 DATA 222,130,6,222,150,6,222,150,
6,104,170,104,168,104,64
```

This article should have opened up a new area for many of you. You will find the DLI tricky to start with, and make sure your routines are quick and simple, but it's well worth mastering.

● *Next month we'll start tinkering with scrolling and use a DLI to control that.*

290	Start of the DLI. Each DLI must begin with a SEI opperand (SEt Interrupt).
300 to 340	Pushes the Accumulator, X and Y registers on to the stack. This must be done because the Interrupt must return control back to the 6502 with all registers intact.
360 to 410	Keeps track of which DLI call has taken place and sets X equal to the line at which the DLI is running from.
420 to 460	Gets a new X position and a new colour and stores them into the HARDWARE registers of player1. Now player1 has been set to a new X position and a new colour. This continues to happen as each DLI line calls the DLI, routine. So the more lines that call a DLI the more splits you can achieve.
470 to 600	Makes the same changes to the three other players.
620	Increases the index counter for the next DLI call.
640 to 690	Restores the 6502 registers and return from Interrupt.
730 to 830	Defines the storage address of the X position and colour tables.

Table II: The assembly listing breakdown

The assembly listing

```
0100 ;
0110 ;SYSTEM EQUATES
0120 ;
0130 COUNT = $D0
0140 HPOSP1 = $D000
0150 HPOSP2 = $D001
0160 HPOSP3 = $D002
0170 HPOSP4 = $D003
0180 PCOL1 = $D012
0190 PCOL2 = $D013
0200 PCOL3 = $D014
0210 PCOL4 = $D015
0220 ;
0230 ;DLI START ADDRESS
0240 ;
0250      *=  $0600
0260 ;
0270 ;DISPLAY LIST INTERRUPT
0280 ;
0290 DLI SEI          ;Set I flag
0300     PHA          ;Save all regs
0310     TYA
0320     PHA
0330     TXA
0340     PHA
0350 ;
0360     LDX COUNT   ;Get DLI call num
ber
0370     CPX #20     ;Start again?
0380     BNE COUNT_OK ;No
0390     LDX #0      ;Yes Reset count
0400     STX COUNT
0410 COUNT_OK
0420     LDA PLAYER1,X ;Get Player1 ne
w X position
0430     STA HPOSP1  ;Plot it
0440     LDA PLCOL1,X ;Get Player1 new
 colour
0450     STA PCOL1   ;Set it
0460 ;Do same for Player2,3 & 4
0470     LDA PLAYER2,X
0480     STA HPOSP2
0490     LDA PLCOL2,X
0500     STA PCOL2
0510 ;Player3
0520     LDA PLAYER3,X
0530     STA HPOSP3
0540     LDA PLCOL3,X
0550     STA PCOL3
0560 ;Player4
0570     LDA PLAYER4,X
0580     STA HPOSP4
0590     LDA PLCOL4,X
0600     STA PCOL4
0610 ;
0620     INC COUNT   ;Set for next cal
l
0630 ;
0640     PLA         ;Restore A,X,Y
0650     TAX
0660     PLA
0670     TAY
0680     PLA
0690     RTI         ;Exit DLI
0700 ;
0710 ;Storage area for PMG X values.
0720 ;
0730 PLAYER1 *= *+20
0740 PLAYER2 *= *+20
0750 PLAYER3 *= *+20
0760 PLAYER4 *= *+20
0770 ;
0780 ;Storage for colour values
0790 ;
0800 PLCOL1 *= *+20
0810 PLCOL2 *= *+20
0820 PLCOL3 *= *+20
0830 PLCOL4 *= *+20
```

Program I

The Basic program

```
100 REM ***************************
110 REM * FX #2 'SPLITING PMGs'  *
120 REM *      by R.Vanner        *
130 REM *  PRESS SYSTEM RESET     *
140 REM *    BEFORE RUNNING       *
150 REM **************************
160 DIM A$(55),B$(1)
170 REM *** SET UP RANDOM CODE ***
180 RESTORE 720
190 FOR A=1 TO 55:READ DAT
200 B$=CHR$(DAT):A$(A,A)=B$
210 NEXT A:X=USR(ADR(A$))
220 REM *** ALLOCATE TOP FOR PMG ***
230 MEM=PEEK(106)-8
240 POKE 106,MEM:GRAPHICS 8
250 REM *** ALTER DISPLAY LIST ***
260 GRAPHICS 0:DL=PEEK(560)+PEEK(561)*
256:SETCOLOR 2,0,0
270 POKE DL+3,194
280 FOR A=DL+6 TO DL+24:POKE A,130:NEX
T A
290 REM *** INIT PMGS ***
300 POKE 53277,3
310 POKE 559,62
320 POKE 623,33
330 POKE 54279,MEM
340 PLAYER1=MEM*256+1024
350 PLAYER2=PLAYER1+256
360 PLAYER3=PLAYER2+256
370 PLAYER4=PLAYER3+256
380 REM *** CLEAR PMG AREA ***
390 FOR A=0 TO 255:POKE PLAYER1+A,0:PO
KE PLAYER2+A,0:POKE PLAYER3+A,0:POKE P
LAYER4+A,0:NEXT A
400 REM *** POKE IN PMG DATA ***
410 RESTORE 450
```

Turn to Page 26 ▶

Program II

```
420 FOR A=40 TO 200:READ C
430 IF C=-1 THEN RESTORE 450:READ C
440 POKE PLAYER1+A,C:POKE PLAYER2+A,C:
POKE PLAYER3+A,C:POKE PLAYER4+A,C:NEXT
 A
450 DATA 0,24,60,102,102,126,102,0
460 DATA 0,126,24,24,24,24,24,0
470 DATA 0,24,60,102,102,126,102,0
480 DATA 0,124,102,102,124,108,102,0
490 DATA 0,126,24,24,24,24,126,0
500 DATA 0,102,102,102,102,102,126,0
510 DATA 0,60,96,60,6,6,60,0
520 DATA 0,126,96,124,96,96,126,0
530 DATA 0,124,102,102,124,108,102,0
540 DATA -1
550 REM *** COPY DATA TO PAGE 6 ***
560 RESTORE 750:A=0:TRAP 600
570 READ DAT
580 POKE 1536+A,DAT
590 A=A+1:GOTO 570
600 REM *** PMG WIDTHS ***
610 FOR A=53256 TO 53259:POKE A,0:NEXT
 A
620 REM *** SET UP SCREEN ***
630 POKE 752,1:POSITION 11,7:? "ATARI
USER FX #2"
640 POSITION 12,8:? "SPLITING PMGS !"
650 POSITION 8,10:? "PRESS ANY KEY TO
ALTER"
660 POSITION 6,12:? "PMG POSITIONS AND
 COLOURS"
670 REM *** TELL ANTIC WHERE TO ***
680 REM *** TO FIND DLI ROUTINE ***
690 POKE 512,0:POKE 513,6:POKE 54286,1
92
700 REM *** GET NEW RANDOM NUMS ***
710 X=USR(ADR(A$)):OPEN #1,4,0,"K:":GE
T #1,DAT:CLOSE #1:GOTO 710
720 DATA 104,162,19,173,10,210,157,90,
6,173,10,210,157,110,6,173,10,210,157,
130,6,173,10,210,157
730 DATA 150,6,173,10,210,157,170,6,17
3,10,210,157,190,6,173,10,210,157,210,
6,173,10,210,157,230
740 DATA 6,202,16,205,96
750 DATA 120,72,152,72,138,72,166,208,
224,20,208,4,162,0,134,208,189,72,6,14
1,0,208,189,152,6
760 DATA 141,18,208,189,92,6,141,1,208
,189,172,6,141,19,208,189,112,6,141,2,
208,189,192,6,141
770 DATA 20,208,189,132,6,141,3,208,18
9,212,6,141,21,208,230,208,104,170,104
,168,104,64
```

Get it right!

LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
100	4063	110	5422	120	5224
130	5652	140	5034	150	4063
160	2391	170	5496	180	2154
190	3880	200	3925	210	4057
220	5882	230	2683	240	4475
250	5453	260	9322	270	2418
280	6764	290	3552	300	2136
310	1973	320	1941	330	2880
340	3729	350	4078	360	4082
370	4086	380	4262	390	17183
400	5059	410	2142	420	3714

LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
430	5828	440	14801	450	4686
460	4206	470	4686	480	4901
490	4399	500	4881	510	3962
520	4721	530	4901	540	1293
550	5293	560	4703	570	1702
580	2823	590	2696	600	3875
610	6644	620	4552	630	8190
640	6397	650	7801	660	8780
670	5478	680	5804	690	6341
700	5570	710	10793	720	13716
730	13729	740	3277	750	13657
760	13690	770	12535		

The Dos map explained

Part 7 of ANDRE WILLEY'S series on the Atari's input/ output facilities

LAST month we started to examine Atari's disc operating system (or Dos), and saw how each disc is split up into 720 or 1040 sectors, each of which contain 128 bytes of data.

This time we will see how Dos 2.5 uses these sectors to store and keep track of programs and data files.

There are basically three types of information which Dos can store in any given sector - directory information, the files themselves or a special table of free space known as the Volume Table of Contents (or VTOC).

The directory is restricted to sectors 361 to 368 and the VTOC data is in sector 360. We took a rather simplified look at the VTOC, but Figure I gives a much better idea of the true Dos 2.5 disc layout - including the special extended VTOC at sector 1024 used in enhanced density mode.

The first three sectors of a Dos disc are used for boot information only (see panel) and can't be accessed for storage, but all other sectors from four onwards are used for files.

Due to a quirk in the design of Dos 2.0, sector 720 was unused and so Dos 2.5 mimics this to maintain full compatibility. Sector 719 is thus the final available sector on a single density disc, with 1023 being the maximum when using enhanced density.

By the time you subtract the eight directory sectors, three boot sectors, the VTOC table and sector 720 you are left with 707 or 1010 free sectors for file storage.

Let's now look at the way Dos handles these sectors. The VTOC data in sector 360 is probably the easiest to understand, and is shown in Figure II.

The first 10 bytes contain general information about the disc. Byte zero is a code digit to indicate the Dos type (normally 2 for Dos 2.0/2.5). Bytes one and two contain the total sector count - 707 ($2C3) or 1010 ($3F2) in low/high format.

Bytes three and four contain the number of currently available sectors. Each time data is written to a file this number is modified to show the new number of free sectors - and it is this number that is returned at the end of a directory listing.

To maintain full compatibility with Dos 2.0 this only gives the number of free sectors which are accessible by both systems - 707 for an empty disc.

Bytes 10 to 99 contain a table of bit-mapped values representing the first 719 sectors on the disc. The rest of sector 360 is unused and filled with zeros. For this reason the extended VTOC information was moved to 1024 - otherwise any use of Dos 2.0 to write files to the disc would corrupt the extended free sector map.

Each byte of free sector information contains eight bits of data, representing one of eight sectors on the disc. The high bit (bit 7, with a value of 128) represents the first of the eight sectors and the low bit (bit 0, with a value of 1) is the last.

If a bit is set (1) then the sector is free and if it is clear (0) then the sector is in use. Whenever Dos assigns sectors for a new file it clears the relevant bits in the VTOC table to stop the sectors being used again. If the file is later deleted the bits are set back to 1 again.

Byte 10 contains the bit-mapped data for sectors 0-7, byte 11 refers to sectors 8-15 and so on up to byte 99 which refers to sectors 712-719.

To give you an idea of how this works, byte 10 of the VTOC table on a newly formatted disc will contain the value 15 ($0F) showing that sectors 0 to 3 are unavailable (the boot information) and sectors 4 to 7 are currently free.

On an enhanced density Dos 2.5 disc this VTOC information is extended into sector 1024, shown in Figure III. Bytes 0 to 83 are simply copies of the last 84 bytes of the main VTOC table, with byte 0 referring to sectors 48 to 55 and byte 83 covering sectors 712 to 719.

Byte 84, the first of the new entries, covers sectors 720 to 727 and thus the high bit (for sector 720) is always zero since it should never be written to. Byte 85 refers to sectors 728 to 735, right up to byte 121 which completes the disc with sectors 1016 to 1023.

Bytes 122 and 123 of the Extended VTOC data supply the free sector count for the enhanced segment of the disc. This would be 303 ($12F) for an

Turn to Page 28 ▶

Sectors	Contents
1-3	Boot information.
4-359	Free for files.
360	VTOC.
361-368	Directory information.
369-719	Free for files.
720	Not used.
721-1023	Free for files (enhanced density Dos 2.5 only).
1024	Extended VTOC (enhanced density Dos 2.5 only).
1025-1040	Not used.

Figure I: Disc sector map for Dos 2.0/2.5 discs.

Byte	Contents
0	Type code (= 2 for Dos 2.0/2.5).
1 - 2	Total number of sectors on disc (707 or 1010).
3 - 4	Number of free sectors (on main disc space).
5	Reserved.
6 - 9	Unused.
10 - 99	Sectors 0-719 usage bit-map (1=free, 0=in use). Byte 10, bit 7 = sector 0 (does not exist). Byte 10, bit 6 = sector 1. ...and so on... Byte 10, bit 0 = sector 7. Byte 11, bit 7 = sector 8. ...and so on... Byte 99, bit 7 = sector 712. Byte 99, bit 0 = sector 719.
100 - 127	Unused (zero).

Figure II: The Volume Table Of Contents (VTOC, Sector 360)

empty disc, which when added to 707 gives the expected 1010. When using Dos 2.5 the two sector count values must be added together before a true Free Sectors result can be obtained.

Sectors 361 to 368 are always flagged as being unavailable for files because they contain the eight directory sectors. Each one of these can contain up to eight filenames, providing the 64-file limit experienced when using Dos 2 or 2.5. Each entry is made up of 16 bytes - five for internal data, eight for the main filename and three for the extender.

Byte 0 provides various bit-mapped information as shown in Figure IV. Bytes 1 and 2 give the number of sectors used in the file (low/high format) and bytes 3 and 4 indicate the first sector used. Bytes 5 to 12 contain the main filename and bytes 13 to 15 contain the extender.

When a file is erased Dos flags the entry in the directory as deleted and frees the relevant sectors from the VTOC table. The entire file will remain intact until another file is written over it, which enables you to recover an accidentally deleted file if you catch your error quickly enough.

The directory entry gives the first sector used in the file and from then on each sector contains 125 bytes of file data followed by three bytes of Dos information.

Bytes 0 to 124 contain the file itself, which may be data, programs, text or anything else you wish to store on disc. In certain cases this area will not be completely full - such as the final sector of a file or after an append operation has taken place. Byte 125 holds the total number of bytes actually used, which is normally 125 ($7D).

The next two bytes contain two pieces of information. The highest six bits of byte 126 hold the file number (0-63), which corresponds to the number of the directory entry for the file. The first file in the directory, for example, would have a value of zero here and the second would give a value of one.

If this number does not match in each of the sectors making up a file then Dos knows that the file has been corrupted and returns an Error 164 (File number mismatch).

The final two bits of byte 126 and the whole of byte 127 are put together to give a 10-bit number which is a pointer to the next sector in the file. This value will be set to zero if there are no more sectors in the chain - at the end of the file.

● *Next month I'll give a Basic program which will allow you to view the various types of sector we have been discussing. But now why not look at the raw data by using the Data Editor from the October 1986* Atari User.

Byte	Contents
0 - 121	Sectors 48-1023 usage bit-map (1=free, 0=in use). Byte 0, bit 7 = sector 48. Byte 0, bit 6 = sector 49. ...and so on... Byte 0, bit 0 = sector 55. Byte 1, bit 7 = sector 56. ...and so on... Byte 84, bit 7 = sector 720 (never used, set to 0). Byte 84, bit 6 = sector 721. ...and so on... Byte 121, bit 7 = sector 1016. Byte 121, bit 0 = sector 1023.
122 - 123	Number of free sectors on enhanced area only.
124 - 127	Unused (zero).

Figure III: The Extended VTOC (Dos 2.5 Enhanced density sector 1024)

Bit	Decimal	Use
0	1	File opened for output/Dos 2.5 "hidden" file flag.
1	2	File created by Dos 2.0/2.5.
2	4	Not used.
3	8	Not used.
4	16	Not used.
5	32	File locked.
6	64	Entry in use for normal file. (Dos 2.0 access available).
7	128	File has been deleted.

A normal Dos 2.0/2.5 file entry would have a value of 66, a "hidden" Dos 2.5 entry would have a value of 3.

Figure IV: Directory file type flag (byte 0 of directory entry)

You can modify some of the parameters provided in the Dos boot information sector to suit your own needs. Once loaded into memory this first disc sector resides at $700 and is laid out as follows:

Byte	Address	Contents
0	$700 (1792)	Boot flag (=0).
1	$701 (1793)	Number of boot sectors (=3).
2	$702 (1794)	Address to load boot sectors (=$700).
4	$704 (1976)	Initialisation address (=$1540).
6	$706 (1798)	Jump to continue load (=JMP $714).
9	$709 (1801)*	Number of sector buffers (=3).
10	$70A (1802)*	Drive enable bits (bits 0-7 = drives 1-8) (=$83).
11	$70B (1803)	Unused.
12	$70C (1804)	Start address for buffers (=$19CC).
14	$70E (1806)	DOS flag (0=No DOS.SYS, 1=DOS.SYS on disc).
15	$70F (1807)	First sector of DOS.SYS file (=$4).
17	$711 (1809)	Offset to Sector link data (=125).
18	$712 (1810)	Start of main DOS.SYS file (=$7CB) (Handler table).
20	$714 (1812)	Start of boot loader code.

You might like to experiment by altering the values marked with an asterisk (*). You could also try POKEing $779 (1913) with 87 to turn the write-with-verify mode off. POKE 1913,80 will turn it back on again. Location $153F (5439) contains the Ascii digit for the drive number to load the DUP.SYS file from.

On a 130XE with Ramdisc this would be set to 56 (Ascii code for the digit eight), but you could alter it to 49 (Ascii code for one) to make DUP.SYS load from the floppy again.

It is not advisable to change any other values without a more thorough knowledge of the system. After POKEing in the new values, go to Dos and use options I and H to make a modified Dos boot disc.

TECHNOLOGY SO ADVANCED ...



MEMORY
* 512Kbytes RAM (520ST-M, FM)
* 1024Kbytes RAM (1040ST-F)
* 192Kbytes ROM
* 128Kbytes external plug-in ROM option

ARCHITECTURE
* *Motorola 68000 Central Processing Unit (CPU) with a clock speed of 8MHz*
* *16-bit external data bus*
* *32-bit internal data bus*
* *24-bit address bus*
* *8×32-bit data & address registers*
* *7 levels of interrupts*
* *56 instructions*
* *14 addressing modes*
* *5 data types*
* *DMA (Direct Memory Access)*
* *real time clock as standard*

GRAPHICS
* *full bit-mapped display*
* *palette of 512 colours*

Using Atari Monitors *(on 520 & 1040):*
* *640×400 high resolution - monochrome*
* *640×200 medium resolution - 4 colours*
* *320×200 low resolution - 16 colours*
* *80 column text display (40 col low res)*

Using Domestic TV *(on 520):*
* *640×200 medium resolution - 4 colours*
* *320×200 low resolution - 16 colours*
* *40 columns × 25 line text display*

SOUND AND MUSIC
* *3 programmable sound channels*
* *frequency programmable 30Hz - 125KHz*
* *programmable volume*
* *wave & dynamic envelope shaping*
* *programmable attack, decay, sustain, release*
* *Musical Instrument Digital Interface (MIDI)*
* *MIDI allows connection of synthesisers etc.*

STANDARD SOFTWARE
* *GEM desktop + TOS operating system*
* *ST BASIC interpreter/language system*

MOUSE
* *high precision*
* *2 button control*
* *free with 520ST-FM/1040ST-F*
* *non slip ball motion sensor*
* *removable ball for easy cleaning*

INPUT/OUTPUT
* *MIDI out .... (5 pin DIN) 31.25K baud*
* *MIDI in .... (5 pin DIN) 31.25K baud*
* *audio out .. 1.0V DC peak to peak, 10K ohm*
* *audio in .... 1.0V DC peak to peak, 10K ohm*
* *RGB monitor .... 1.0V DC, 75 ohm*
* *mono monitor .... 1.0V DC, 75 ohm*
* *mono horizontal scan rate 35.7KHz*
* *mono vertical scan rate 71.2KHz*
* *sync .... 5V DC (active low) 3.3K ohm*
* *modem/serial ...... RS232C, 50 to 19,200 baud*
* *floppy disk .... 250 Kbits/s*
* *hard disk .... 11.3 Mbits/s*
* *mouse .... standard Atari connector*
* *joystick .... standard Atari connector*
* *cartridge port .... 128K capacity*
* *RF output (520ST-FM) .... for TV use*

OPERATING SYSTEM
* *TOS with GEM environment in ROM*
* *hierarchical file structure with sub-directories and path names*
* *user interface via GEM, with self explanatory command functions*
* *multiple windows + icons*
* *window resizing, re-positioning and erasing*
* *drop down menus (selected by mouse)*
* *GEM virtual device interface*

COMMUNICATIONS
* *RS-232C serial modem port*
* *8-bit parallel printer port*
* *MIDI port (also for networking use)*
* *VT52 terminal emulation*

KEYBOARD
* *standard QWERTY typewriter format*
* *95 full stroke keys*
* *10 function keys*
* *18 key numeric keypad + cursor keys*
* *variable auto-repeat & key click response*
* *keyboard processor reduces CPU overhead*

... IT'S AFFORDABLE

ONLY FROM SILICA

Finally, there's a personal computer that not only solves problems like other computers, but also solves the one problem that other computers have created. Affordability. Silica Shop are pleased to present the ST range of personal/business computers from Atari. The ST was designed utilizing the most recent breakthroughs in semiconductor technology, producing a personal computer that performs tasks with fewer parts. Which means it costs less to make. And less to buy. The latest ST computers now include built in power supplies and built in disk drives. The TOS operating system and GEM window environment are now on ROM chips which are already installed in the ST keyboard. This enables automatic instant booting when you switch on. Silica Shop are pleased to offer the complete Atari ST range. Our mail order department is situated in Sidcup and we have 4 retail outlets at Sidcup, Orpington, Lion House (Tottenham Court Rd) and Selfridges (Oxford Street). We have eight years experience of Atari products, longer than any other UK company, and are well established as the UK's No.1 Atari specialist. With a group turnover of over £5 million and in excess of 70 staff, we provide unbeatable service and support. We provide several facilities which you will find invaluable during your Atari computing life and most of these facilities are available **ONLY FROM SILICA**. We suggest that you read through what we have to offer, before you decide where to purchase your Atari ST.

FREE STARTER KIT - Only From Silica

When you purchase any Atari ST keyboard, you will not only receive the best value for money computer on the market, but you will also receive the following from Atari Corporation as part of the package:

* *BASIC Language Disk* * *BASIC Manual* * *ST Owners Manual* * *TOS/GEM on ROM*

If you buy your ST from Silica Shop, you will also receive:

* *NEOchrome - colour graphics program* * *1st Word - Word Processor*

In addition, we at Silica would like to see you get off to a flying start with your new computer, so we have put together a special **ST STARTER KIT** worth over £100, which we are giving away **FREE OF CHARGE** with every ST computer purchased at our normal retail prices. This kit is available **ONLY FROM SILICA** and is aimed at providing users with a valuable introduction to the world of computing. We are continually upgrading the ST Starter Kit, which contains public domain and other licensed software, as well as books, magazines and accessories all relevant to ST computing. Return the coupon below for full details.

DEDICATED SERVICING - Only From Silica

At Silica Shop, we have a dedicated service department of five full time Atari trained technical staff. This team is totally dedicated to servicing Atari computer products. Their accumulated knowledge, skill and experience makes them second to none in their field. You can be sure that any work carried out by them is of the highest standard. A standard of servicing which we believe you will find **ONLY FROM SILICA**. In addition to providing full servicing facilities for Atari ST computers (both in and out of warranty), our team is also able to offer memory and modulator upgrades to ST computers.

1Mb RAM UPGRADE: Our upgrade on the standard Atari 520ST-M or 520ST-FM keyboard will increase the memory from 512K to a massive 1024K. It has a full 1 year warranty and is available from Silica at an additional retail price of only £86.96 (+VAT = £100).

TV MODULATOR UPGRADE: Silica can upgrade the 1040ST-F to include a TV modulator so that you can then use it with your TV set. This is an internal upgrade and does not involve any untidy external boxes. A cable to connect your ST to any domestic TV is included in the price of the upgrade which is only £49 (inc VAT). The upgrade is also available for early 520ST computers at the same price.

THE FULL STOCK RANGE - Only From Silica

We aim to keep stocks of all Atari related products and our warehouse carries a stock of £½ million. We import many software titles direct from the USA and you will find that we have new releases in advance of many of our competitors. Unlike dealers who may only stock selected titles, we have the full range. In addition, we carry a complete line of all books which have been written about the Atari ST. A range as wide as ours is something you will find is available **ONLY FROM SILICA**.

AFTER SALES SUPPORT - Only From Silica

Rest assured that when you buy your ST from Silica Shop, you will be fully supported. Our free mailings give news of releases and developments. This will help to keep you fully up to date with what's happening in the Atari market. And in addition, our sales staff are at the end of a telephone line to service all of your Atari requirements. If you purchase an ST from Silica and would like any programming or technical advice, we have a full time technical support team to help you get the best from your computer. Because we have both the staff and the systems specifically dedicated to providing after sales service on Atari ST computers, we are confident that our users enjoy an exceptionally high level of support. This can be received **ONLY FROM SILICA**.

FREE CATALOGUES - Only From Silica

At Silica Shop, we recognise that serious users require an in-depth information service, which is why we mail free newsletters and price lists to our ST owners. These are up to 48 pages long and are crammed with technical details as well as special offers and product descriptions. If you have already purchased an ST and would like to have your name added to our mailing list, please complete the coupon & return it to us. The information service is available **ONLY FROM SILICA**.

FREE OVERNIGHT DELIVERY - From Silica

Most orders are processed through our computer within 24 hours of receiving them. Most hardware orders are sent by the overnight METRO courier service FREE OF CHARGE to customers within the UK. This method helps to ensure minimum delay and maximum protection.

PRICE MATCH - Only From Silica

We hope that the combination of our low prices, FREE UK delivery service, FREE Starter Kit and FREE after sales support, will be enough to make you buy your Atari equipment from Silica Shop. If however, there is something you wish to purchase, and you find one of our competitors offering it at a lower price, then please contact our sales department, providing us with our competitor's name, address and telephone number. If our competitor has the goods in stock, we will normally match the offer (on a 'same product - same price' basis) and still provide you with our normal free delivery. We realise that we are not the only company who will match a competitor's price. However, if you come to us for a price match, you will also be entitled to our after sales service, including free newsletters and technical support. This makes our price match promise rather special, something you will receive **ONLY FROM SILICA**. We don't want you to go anywhere else for your Atari products. So shop at Silica, the UK's No1 Atari Specialist.

SIDCUP (& Mail Order) **01-309 1111**
1-4 The Mews, Hatherley Road, Sidcup, Kent, DA14 4DX

LONDON **01-580 4839**
Lion House (1st floor), 227 Tottenham Court Rd, London, W1

LONDON .... **01-629 1234 ext 3677**
Selfridges (1st floor), Oxford Street, London, W1A 1AB

520ST-M

The affordability of Atari computers is reflected in the price of the 520ST-M keyboard, which is a mere £259 (inc VAT). This version of the ST comes with 512K RAM, as well as a modulator and lead for direct connection to any domestic TV. The price does not include a mouse. In addition, when you buy your 520ST-M from Silica, you will also receive the FREE Silica 'ST Starter Kit'. During 1987, many software houses will be producing games software on ROM cartridges, which will plug directly into the cartridge slot on the 520ST-M keyboard, giving instant loading without the expense of purchasing a disk drive. With the enormous power of the ST, you can expect some excellent titles to be produced, making this the ultimate games machine! If your requirement is for a terminal, then the 520ST-M can fulfill this role too. Leads are available to connect the ST to a variety of monitors, and with the imminent introduction of terminal software on ROM cartridge, the ST provides a low price terminal for business use. If you wish to take advantage of the massive range of disk software available for the ST range, you will need to purchase a disk drive. Atari have two floppy disk drives available, a ½ Mbyte model £149 and a 1Mbyte model £199. Full details of these drives, as well as the Atari 20Mbyte hard disk are available on request. If required at a later date, the mouse may be purchased separately.

£259

520ST-FM

The 520ST-FM with 512K RAM and free mouse, represents a further breakthrough by Atari Corporation in the world of high power, low cost personal computing. This model is the latest addition to the ST family, and is not only powerful, but compact. It is priced at only £399 (inc VAT) a level which brings it within the reach of a whole new generation of computer enthusiasts. When purchased from us, it comes with the FREE Silica 'ST Starter Kit' see paragraph on the left. To make the 520ST-FM ready for use straight away, Atari have built into the keyboard a ½ megabyte disk drive for information storage and retrieval, allowing you easy access to the massive range of disk based software which is available for the ST. This new computer comes with all the correct cables and connections you will need to plug it straight into any standard domestic television set. You do not therefore have to purchase an Atari monitor. If you do require a monitor however, these are available with the 520ST in the following money saving packages:

520ST-FM Keyboard	*Without Monitor*	- **£399** *(inc VAT)*
520ST-FM Keyboard	*+ High res mono monitor*	- **£499** *(inc VAT)*
520ST-FM Keyboard	*+ Low res colour monitor*	- **£599** *(inc VAT)*
520ST-FM Keyboard	*+ Med res colour monitor*	- **£699** *(inc VAT)*

Because the 520ST-FM has its own power transformer built into the keyboard, there are no messy external adaptors to clutter up your desk space. You are left with only one mains lead, serving both the disk drive and the computer. You couldn't ask for a more stylish and compact unit.

£399

1040ST-F

For the businessman and the more serious home user, Atari have their most powerful model, the 1040ST-F with 1028K RAM. This low cost powerhouse can be introduced into a business environment as a stand-alone system, or can support a mainframe computer as a terminal. The 1040ST-F not only features twice as much memory as the 520ST-FM, but also includes a more powerful built-in disk drive. The drive featured on the 1040ST-F is a one megabyte double sided model. The extra memory facility of the 1040ST-F makes it ideal for applications such as large databases or spreadsheets. Like the 520ST-FM, the 1040ST-F has a mains transformer built into the console to give a compact and stylish unit with only one mains lead. The 1040ST-F is also supplied from Silica Shop with a free software package and 'ST STARTER KIT'. In the USA, the 1040ST-F has been sold with a TV modulator like the 520ST-FM. However, for the UK market, Atari are manufacturing the 1040ST-F solely with business use in mind and it does not currently include an RF modulator, this means that you cannot use it with a domestic TV (Silica Shop do offer a modulator upgrade for only £49). The 1040ST-F keyboard costs only £599 (inc VAT) and, unless a modulator upgrade is fitted, will require an Atari or third party monitor. There are three Atari monitors available and the prices for the 1040 with these monitors are as follows:

1040ST-F Keyboard	*Without Monitor*	- **£599** *(inc VAT)*
1040ST-F Keyboard	*+ High res mono monitor*	- **£699** *(inc VAT)*
1040ST-F Keyboard	*+ Low res col monitor*	- **£799** *(inc VAT)*
1040ST-F Keyboard	*+ Med res col monitor*	- **£899** *(inc VAT)*

The 1040ST-F comes with a mouse controller and includes 1Mbyte of RAM. It has a 1Mbyte double sided disk drive and mains transformer, both built into the keyboard to give a compact and stylish unit, with only one mains lead.

£599

ATARI ST

To: Silica Shop Ltd, Dept ATUSR 0887, 1-4 The Mews, Hatherley Road, Sidcup, Kent, DA14 4DX

PLEASE SEND ME FREE LITERATURE ON THE ATARI ST

Mr/Mrs/Ms: .... Initials: .... Surname: ....

Address: ....

....

....

.... Postcode: ....

Do you already own a computer
If so, which one do you own? ....

Dungeons abound – on TV, too

by Rouloc

WELCOME! It is good to meet you all again – adventurers everywhere are always welcome at my door as long as they have a good story to tell.

Sit with me and we shall talk of puzzles past and traps to come and fiendish twists to frustrate your mind as well as your best sword arm.

First, thank you for all your letters. I'm pleased to see that so many are able to compete with me in solving these brain teasing adventures. I may well ask you to accompany me on one of my quests and do all the donkey work while I sit around all day and sing about gold (have I seen someone else do that somewhere?).

Now, on to some of the latest gossip from the Inn. I'm pleased to report that I have in my possession the very latest copy of Alternate Reality – The Dungeon. This is the sequel to The City, and gives you the chance to explore four levels of dark, dank and decidedly dangerous dungeons.

There are multitudes of new monsters to bash, plenty of quests to undertake, and over a third more to map out than the previous game. With the package comes a message from a fellow victim called, funnily enough, Trillog (no relation) and a handsome manual which by all accounts is very informative.

More episodes are planned, including The Arena, The Palace, The Wilderness, Revelation and Destiny. By next month I shall have got well into the Dungeon and will bring you news of my findings.

Another slice of hot gossip in the tavern is of a major new television programme all about adventure, called Knightmare.

It is from Anglia and features teams of adventurers who have to explore a Dungeons and Dragons scenario created on screen by the use of a 24 bit Supernove computer.

The producer acts as Dungeon Master and decides which scene the brave bunch should work through next. If they complete the quest, they return the next week to play at a higher level. Sounds great fun.

Thanks to Darren Fradgley, this month's map is Level Nine's Worm in Paradise. The map isn't complete, but it shows some excellent locations and should prove invaluable to anyone stuck in the early stages of the game.

See you next month

Jinx hints

Here are some clues for Hollywood Hijinx sent in by Mark Powell:

- To enter the house try reading the poem in the package and turn to the statue.
- In the closet, try pulling pegs to get to different floors. Lift the painting to find a safe, and the statues should give you a hand with the combination.
- Stuck in the maze? Look in the letter box for one half of the map.
- Can't find all the punch cards? Try the piano, painting, fireplace, bathroom rug and the closet shaft.
- Tokyo a problem? Save the red button until last, and just keep moving east. Stamp the tanks and swipe the planes. Forget the rocket just take care of the lorry.
- Stairs proving dangerous? Try winter sports.
- Can't get up the stairs in the house? Look at number two then turn to one of your Uncle's rivals.
- Punch cards won't work? Examine the business card and note the name. When you realise the correct order search for all the cards insert them into the computer in order.





MARK Watson noticed in the June issue of *Atari User* that Donna Thresher is having problems with Ten Little Indians. He has kindly given me this list of hints: To leave the train type WAIT and don't leave the train at the wrong station.

You only get eight moves in the mud. GO WINDOW in the blue bedroom, take notice of the ads but ignore the gamekeeper.

Ian Gadd says he is a very frustrated adventurer because he is stuck in The Pawn at the guru location. Well Ian I hope you saw my clues in the June issue of *Atari User*.

If not, the answer lies with you. If you cover your wristband, the guru will give you a bowl. You then go up the mountain and fill it with water – it's all downhill from there.

C.M. Dunn tells of a neat way to keep the door open in Cloak of Death. The door is at the bottom of the stairs and if you leave the chest against its open side it will not slam shut.

Mark Powell, from East Sussex, has given me a lot of clues on Infocom's Hollywood Hijinx, but is himself stuck in a few places. He wants to know how to get a light source under water, and also in the screening room, he cannot read the film as its all washed out. Also he can't get the loft ladder up the cliff or find out what pushing the piano does.

Finally, P Kirby (otherwise known as Arathorn, Pallas, Fuzwuz or Sparrow) has been playing Ultima III for nearly a year and still can't find the Mark of the Snake. Neither does he know where to use the BEG or DIG commands.

Well Arathorn, I'm only an expert on Ultima IV and my friend Dinto, who managed to finish Ultima III, unfortunately perished last summer in a major fracas involving his good self and 16 orcs who didn't like his orc head shoes. Still thats life.

Troubles really start in Hell

BRIMSTONE is the first Electric novel from Broderbund released via US Gold. It is a text only game with a hard back book depicting the characters and giving general background information about the story to accompany it.

The game is a very classy piece – well coded and bears a striking resemblence to (dare I say it?) Infocom's style – long descriptive passages and very humorous interchanges with the characters.

The story is in fact a dream by Sir Gawain, one of Arthur's Round Table knights, who thinks he has found the gateway to Hell in an old castle.

It is formed into chapters and as you progress through the adventure different leads will present themselves to get you to the next chapter. So each time you play it a different route will lead to a different event.

That is the first difference. The second is a quick resume of what you have achieved so far – a sort of "what happened in last week's episode?" type of summary which lets you know how you are doing in relation to finishing the game.

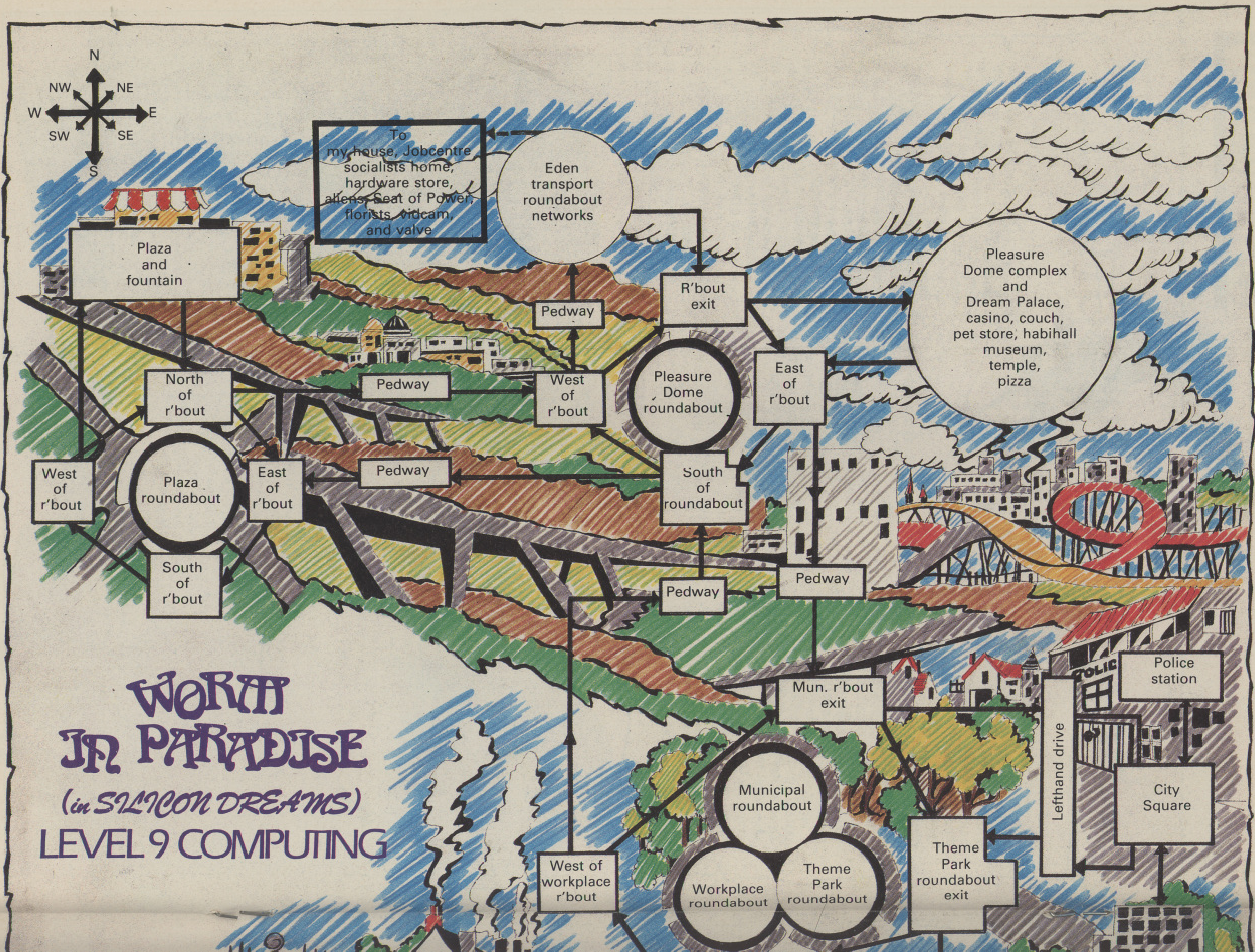
There are in fact two parts to the story. The first involves getting to the gateway, which is pretty tricky, and the second is in Hell – where your troubles really start.

There is one other new idea: The program will sense if you are in trouble. It will decide that the puzzle is too hard for you, and put forward a gentle hint by itself. Very subtle. A case in point is that when I was stuck in ice and after a few blank moves it threw up a line "You think of summer".

This was a clue, and by thinking of another word that belongs with summer I was able to get on my way.

This game, along with Mindwheel and Essex, are first class adventures. A bit pricey, but well worth the investment.

Program: Brimstone
Price: £24.99 (disc only)
Supplier: US Gold, Units 2 & 3, Holford Way, Holford, Birmingham, B6 7AX
Tel: 021-356 3388


N
NE
E
SE
S
SW
W
NW
To my house, Jobcentre socialists home, hardware store, aliens, Seat of Power, florists, vidcam, and valve
Eden transport roundabout networks
Plaza and fountain
R'bout exit
Pleasure Dome complex and Dream Palace, casino, couch, pet store, habihall museum, temple, pizza
Pedway
North of r'bout
Pedway
West of r'bout
Pleasure Dome roundabout
East of r'bout
West of r'bout
Plaza roundabout
East of r'bout
Pedway
South of roundabout
South of r'bout
Pedway
Pedway
Police station
Mun. r'bout exit
Lefthand drive
City Square
Municipal roundabout
West of workplace r'bout
Workplace roundabout
Theme Park roundabout
Theme Park roundabout exit
WORM IN PARADISE
(in SILICON DREAMS)
LEVEL 9 COMPUTING


r'bout
Workplace roundabout
exit
Workplace
Workplace roundabout exit
HOSPITAL
CURIOS
Fabulous Riverboat
Earthsea
Colourful sands
Hothouse
Old Curiosity Shop and medallion
E/W Glory Road and newsvendor
Flatlands
Westend of road and memorial
Long and winding road
E/W yellow brick road
Gate of Irvill and flag seller
Ancient Lankhr
Little House on the Prairie, pieman and pie
Yearwood
Duncton Wood
Dream Park
Fountain of Paradise
Well of Souls
N
S
IN
ATARI USER



By DAVID RAWLINGS

IT is the year 2999 and Earth has been at war with the evil Veruccan Empire for almost 25 years. There is nuclear fallout over most of Earth and many survivors have moved to vast underground caves on the Moon.

But now the ultra evil and incredibly nasty Veruccan leader Vyruus has discovered where the survivors are and has hidden a proteum bomb at the far reaches of the caverns.

You have been chosen to disarm the bomb. Unfortunately you are flying a booby-trapped Veruccan fighter which means that the hidden defences in the caves will attempt to destroy you.

Your task is to negotiate the underground caverns, rising lysozomes and the wicked space plunger in an attempt to reach the proteum bomb. When you have reached the device, it has to be activated and your ship is then paralysed for 30 seconds while the booby-trap is made safe. You then have to exit the caverns backwards and land on the right of the launch zone.

If you achieve this before the bomb explodes it will be deactivated. If you don't escape or crash the whole lunar hemisphere will be destroyed and Vyruus will have the satisfaction of seeing you die along with the remainder of the human race.

That's the challenge – your freedom and the survival of the human race is guaranteed if you manage to deactivate the bomb.

You have five lives and each collision on the way in loses one. One on the way out detonates the bomb.

The joystick is used to move the ship left or right and the fire button provides thrust to vary the speed of descent.

Unfortunately the Moon now has an exceptionally strong gravitational field, so your ship requires extensive and very heavy fuel supplies. This leads to great momentum and slower stick response. The time you have to get out is not revealed but an ever-rising tone gives some indication as to your expected doom.

The program is written mainly in Basic but machine code routines have been added for player missile movement, collision detection and some special effects. So climb into your fighter and save the human race from the evil Vyruus.

Turn to Page 37 ▶

Set up your own closed user group on MicroLink

MicroLink is ideal for transferring instant information between groups of people – between branches of a company, members of a club or just friends with like-minded interests.

Whether there are five or 500 people in the group, they can all be sent the same information in one operation . . . instantly.

And each recipient can immediately send a reply, or his own comments, to every other member of the group.

Head offices of companies use MicroLink to send daily memos to their regional offices. Chains of shops use MicroLink to receive daily trading reports from their branches.

It's cheap, reliable – and it's 100 per cent secure, because information sent via MicroLink can only be seen by the person for whom it is intended.

Details from 061-456 8383.

MicroLink *electronic mail and much, much more!*

SUNARO
SOFTWARE

	Cass	Disk
Arkanoid	7.95	10.95
Astro Droid 64k	6.95	8.95
Atari Aces	8.50	—
Colossus Chess IV	8.50	12.75
Conflict in Vietnam	14.95	16.95
Crumbles Crisis 64k	6.95	8.95
Fight Night	8.50	12.75
Fighter Pilot	8.50	10.95
Football Fortunes	12.75	15.95
Gauntlet 64k	8.50	12.75
Gauntlet Deeper Dungeons	4.95	6.95
Ghostbusters	8.50	12.75
Green Beret	7.95	—
Hardball	8.50	12.75
International Karate	5.95	10.95
Jewels of Darkness 64k	12.75	12.75
Kennedy Approach	8.50	12.75
Leaderboard	8.50	12.75
Leaderboard Tournament	4.95	6.95
Mecenary Compendium	12.75	14.95
Phantom	6.95	8.95
Platform Perfection 64k	8.50	—
Robot Knights	6.95	8.95
Screaming Wings	6.95	8.95
Shoot em Ups	8.50	—
Silent Service	8.50	12.75
Silicon Dreams	12.75	12.75
Smash Hits 6	8.50	12.75
Smash Hits 7	8.50	12.75
Solo Flight II	8.50	12.75
Space Lobsters	6.95	8.95
Spindizzy	8.50	12.75
Spitfire 40	7.95	10.95
Spy V Spy I	8.50	12.75
Spy V Spy II	8.50	12.75
Star Quake	7.95	10.95
Sun Star	6.95	10.95
Super huey	8.50	12.75
Technicolour Dream	8.50	10.95
Tomahawk 64k	8.50	12.75
Trailblazer	8.50	12.75
Trivial Pursuit	12.75	16.95
World Cup Manager	8.50	10.95

	Disk
Alternate Reality	16.95
Broadsides	21.95
Flight Simulator II	39.95
Footballer of the Year	12.75
Graphic Arts Dept.	19.95
Hollywood Hi Jinks	21.95
Mini Office II	17.95
Moonmist	21.95
Pawn 64k	16.95
Superscript	59.95
Wargame Construction Set	16.95
Wizards Crown	16.95

Budget Cassettes

Alley Cat	2.95
Beer Belly Burt	2.95
Bounty Bob Strikes 64k	2.95
Bubble Trouble	2.95
Caverns of Eriban	1.95
Collapse	1.95
Colony	1.95
Crystal Raider	1.95
Dimension X	2.95
Dropzone	2.95
Excelsor	1.95
Frenesis	1.95
Football Manager	2.95
Gunlaw	1.95
Invasion	1.95
L.A. Swat	1.95
Masterchess	1.95
Molecule Man	1.95
Powerdown	1.95
River Alley	2.95
Strathosphere	1.95

SPECIAL OFFER
(while stocks last)

	Cass	Disc
Aztec	5.95	9.95
Mr. Robot	5.95	9.95
Montezuma's Revenge	5.95	9.95
Tail of Beta Lyrae	5.95	9.95
Boulderdash Contruction Set	5.95	9.95

Large selection of ST software available
NEW TITLES AVAILABLE IMMEDIATELY ON RELEASE
TELEPHONE (0625) 25228
Orders over £5 include postage please add 50p to orders of £5 or under
Send Cheque/PO's to:

SUNARO SOFTWARE (AU)
PO BOX 78, MACCLESFIELD, CHESHIRE SK10 3PF
(Est 1984)

ENTERTAINMENT
from S.T.V. SOFTWARE
"NEW RELEASE" 15.8.87

"DARG"

from the Planet Dargon

A variable speed arcade game in brilliant colour. Collect the blue Crystals from each screen to re-fuel Darg's space ship. Careful planning is required on each stage to avoid crushing Darg, blowing him up or gassing him. Hours of enjoyment at a budget price of:

£3.99 cassette £7.99 disc 40p P&P
A definite top ten contender!!!

ALSO BY STV
"WORLD CUP MANAGER"
£8.39 cassette £11.19 disc INC P&P

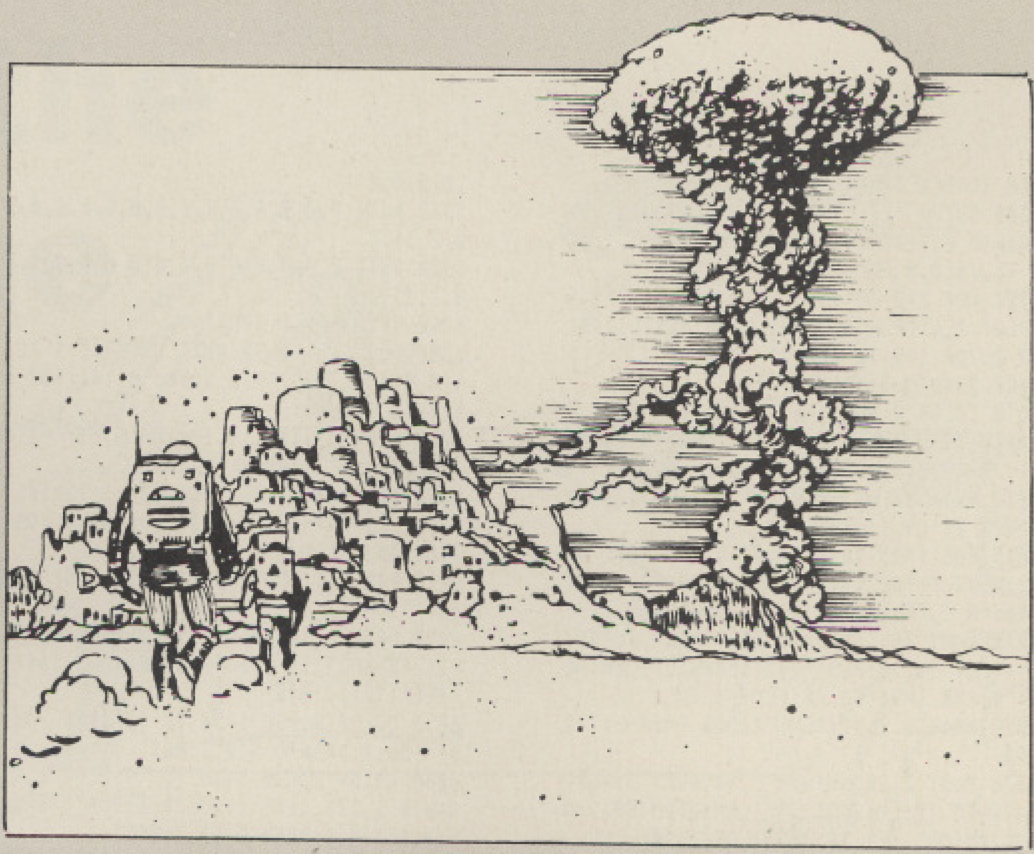
"JOE AND THE NUCLEAR CAVERN"
£3.99 cassette £7.99 disc 40p P&P

Also available from Your Local Software House

Send cheque or P.O. to:
S.T.V. Services & Software, 9 Chiswick Walk, Chelmley Wood, B'ham B37 6TA
Tel: (021) 770 1003
(NOTE S.T. GAMES WANTED)

Also available from Your Local Software House

```
1 REM MISSION X.
2 REM BY D.RAWLINGS.
3 REM (c)ATARI USER.
4 REM
9 REM SETS UP SUBROUTINES
10 POKE 1661,0:POKE 1790,0:GOSUB 11000
:GOTO 80
12 COLOR 2:SOUND 2,8,4,15:PLOT 12,23:D
RAWTO 25,23:PLOT 12,32:DRAWTO 25,32:PL
OT 35,56:DRAWTO 51,56
14 COLOR 0:PLOT 12,23:DRAWTO 25,23:PLO
T 12,32:DRAWTO 25,32:PLOT 35,56:DRAWTO
 51,56:SOUND 2,0,0,0:RETURN
15 COLOR 2:SOUND 2,3,4,15:PLOT 80,35:D
RAWTO 100,35:PLOT 80,45:DRAWTO 100,45:
COLOR 0:PLOT 80,35:DRAWTO 100,35
16 PLOT 80,45:DRAWTO 100,45:SOUND 2,0,
0,0:RETURN
30 COLOR 2:PLOT 65,W-1:PLOT 64,W:PLOT
66,W:COLOR 0:PLOT 65,W+1:PLOT 64,W+2:P
LOT 66,W+2:W=W-1:IF W=7 THEN W=57
35 RETURN
40 COLOR 0:PLOT R,60:DRAWTO R,69:R=R+1
:COLOR 2:PLOT R,60:DRAWTO R,69:IF R=10
6 THEN COLOR 0:PLOT 106,60
45 IF R=106 THEN COLOR 0:PLOT 106,60:D
RAWTO 106,69:R=92
46 RETURN
80 OPEN #1,4,0,"K:":PMBASE=54279:RAMTO
P=106:SDMCTL=559:HITCLR=53278:P0PF=532
52:GRACTL=53277:HPOSP0=53248:TRAP 1000
90 DEG :HPOSM0=53252:HPOSP1=53249:HPOS
M1=53253:PCOLR0=704:PCOLR1=705:FD=0.16
:R=92:W=57:E=0:HPOSP2=53250
100 GOSUB 4000:LM=1:POKE HPOSP2,45:POK
E 706,7+7*(DIF>1)
180 REM MAIN LOOP
190 S=0:POKE 710,52:POKE PCOLR0,120:PO
KE PCOLR1,30:POKE HITCLR,0:HL=0:HS=0
200 FOR K=0 TO HL:S=S+0.05:POKE HPOSM1
,10*S+140
210 XX=USR(1662):IF PEEK(1660)=1 THEN
1000
220 IF XM0<110 THEN X1=5:POKE HPOSP1,5
:SOUND 0,0,0,0:SOUND 1,0,0,0:GOTO 240
230 POKE HPOSP0,X0:POKE HPOSP2,PEEK(20
)
235 IF STRIG(0)=0 THEN X1=X0:POKE HPOS
P1,X1:SOUND 0,204,0,8:SOUND 1,128,0,8:
XM0=XM0-FD:POKE HPOSM0,XM0:S=S-0.15
240 IF STRIG(0)=1 THEN X1=5:POKE HPOSP
1,X1:SOUND 0,0,0,0:SOUND 1,0,0,0
245 IF X0>95 AND X0<115 THEN GOSUB 30
247 IF Y0>137 THEN GOSUB 40
250 IF S>0 THEN 300
260 IF S<0 THEN 400
270 GOTO 500
300 FOR I=0 TO S:RES=USR(1574,P0,P1):Y
0=Y0+1:NEXT I
337 GOTO 500
400 IF Y0>12 THEN FOR I=S TO 0:RES=USR
(1536,P0,P1):Y0=Y0-1:NEXT I
480 GOTO 500
500 NEXT K:SOUND 3,16*(16-PEEK(19))*B,
10,8:IF PEEK(20)<10 THEN GOSUB 12
504 IF X0>120 THEN IF PEEK(20)<100 THE
N GOSUB 15
505 HL=5-5*ABS(HS):IF STICK(0)=15 AND
HS<0 THEN HS=HS+0.01:SOUND 2,0,0,0:GOT
O 525
515 IF STICK(0)=15 AND HS>0 THEN HS=HS
-0.01:SOUND 2,0,0,0:GOTO 525
520 IF STICK(0)>4 AND STICK(0)<8 THEN
HS=HS+0.35:SOUND 2,10,0,4:IF HS>1.5 TH
EN HS=1.5
522 IF STICK(0)>8 AND STICK(0)<12 THEN
 HS=HS-0.35:SOUND 2,10,0,4:IF HS<-1 TH
EN HS=-1
525 X0=X0+INT(HS):GOTO 200
990 REM COLLISION SORT
1000 POKE HITCLR,0:POKE HPOSP1,5:SOUND
 0,0,0,0:SOUND 1,0,0,0:GOTO 1100
1020 IF STRIG(0)=0 THEN GO TO 1040
1030 GOTO 1020
1040 FOR I=0 TO 1:RES=USR(1536,P0,P1):
NEXT I:GOTO 190
1100 IF X0>55 AND X0<61 AND Y0<50 AND
Y0>28 AND S<1 THEN 1020
1110 IF X0>80 AND X0<171 AND Y0<50 AND
 S<1 AND B=1 THEN 1120
1113 IF X0>180 AND X0<186 AND Y0>130 A
ND Y0<145 AND S<1 THEN GOSUB 6000:GOTO
 1020
1115 GOTO 2000
1120 FOR I=70 TO 255:SOUND 3,I,10,15-I
/17:SOUND 1,10,8,15-I/17:NEXT I:FOR I=
0 TO 3:SOUND I,0,0,0
1125 NEXT I:POKE SDMCTL,0
1130 POKE GRACTL,0:SC=XM0*10*PEEK(19)*
DIF:POKE PCOLR1,0:POKE PCOLR0,0:GRAPHI
CS 17:POSITION 5,5:? #6;"WELL DONE"
1140 POSITION 6,12:? #6;"SCORE ";INT(S
C):FOR I=I TO 900:NEXT I:RUN
2000 LM=LM+1:FOR I=1 TO 260 STEP 8:SOU
ND 0,I,8,15:NEXT I
2010 FOR I=200 TO 1 STEP -1:POKE 704,I
:SOUND 0,I,8,15:NEXT I:SOUND 0,0,0,0:S
OUND 2,0,0,0
2015 POKE HPOSP0,5:POKE HPOSP1,5:POKE
HPOSM0,5:POKE HPOSM1,5
2017 IF B=1 THEN 10000
2020 IF LM>5 THEN 2100
2070 GOSUB 5000:GOTO 190
2100 ? "HARD  LUCK!!- NO SCORE THIS TI
ME":? "PRESS ANY KEY TO TRY AGAIN";
2135 GET #1,K:POKE GRACTL,0:POKE 1790,
1:CLOSE #1:CLR :GOTO 80
3990 REM SCREEN DRAWING ROUTINE
4000 IF PEEK(1790)=1 THEN GOTO 4100
4002 GRAPHICS 7:LV=-5+DIF
4003 REM POKE 559,0:DELETE REM FOR FAS
```



PROGRAM BREAKDOWN

12–46	Series of fast subroutines to draw laser gates and move other objects.
190–525	Main program loop, ship movement, stick response and collision detection.
1000–2135	Collision sorting and explosion routines. Screen information.
4000–4990	Drawing routine. This draws main scenery. Deleting the rem in line 4003 allows faster screen drawing, but the screen will be blank during the drawing routines.
5000–5990	Player missile graphics set up.
6000–6200	Bomb activation sequence.
10000–10420	Bomb detonation routine.
11000–11520	Data store for machine code routines and screen data.

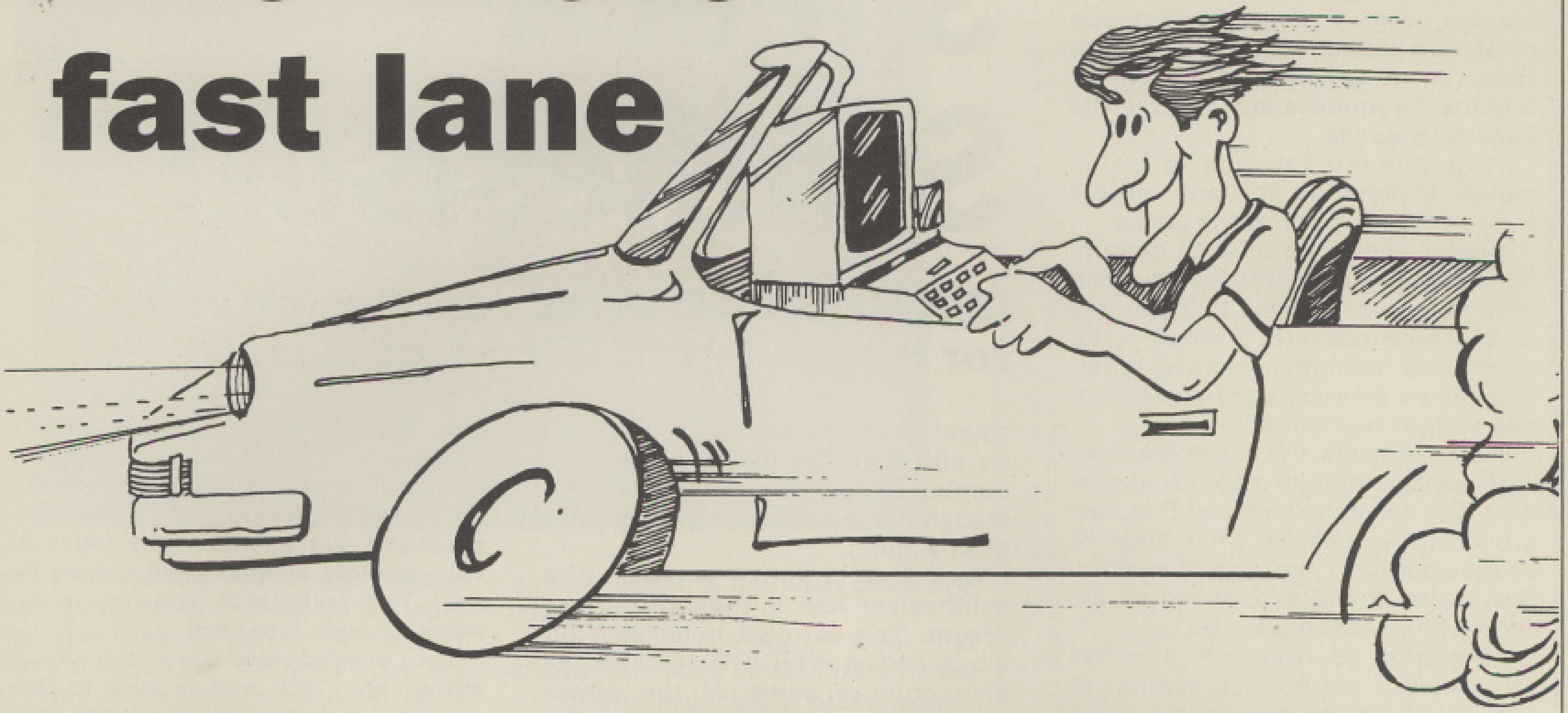
Turn to Page 38 ►

```
TER SCREEN DRAW
4005 COLOR 1:PLOT 159,79:DRAWTO 159,5:
DRAWTO 0,5:POSITION 0,79:POKE 765,1:XI
O 18,#6,0,0,"S:"
4007 FOR I=0 TO 159:COLOR RND(0)*2+1.5
:PLOT I,4:DRAWTO I,RND(0)*4:NEXT I:COL
OR 0:FOR I=0 TO 4:PLOT 10,I
4008 DRAWTO 34,I:NEXT I
4010 COLOR 0:FOR I=5 TO 12:PLOT 20,I:D
RAWTO 29-LV,I:NEXT I:FOR I=12 TO 20:PL
OT 20+12-I,I:DRAWTO 29+12-I-LV,I
4012 NEXT I:FOR I=20 TO 35:PLOT 12,I:D
RAWTO 21-LV,I:NEXT I
4015 FOR I=35 TO 60:PLOT 5,I:DRAWTO 30
,I:NEXT I:FOR I=22 TO 31-LV:PLOT I,60:
DRAWTO I,77:NEXT I:FOR I=68+LV TO 77
4017 PLOT 20,I:DRAWTO 50,I:NEXT I:FOR
I=41+LV TO 50:PLOT I,77:DRAWTO I,20:NE
XT I:FOR I=35 TO 70:PLOT I,20
4020 DRAWTO I,55:NEXT I:FOR I=61+LV TO
 70
4026 PLOT I,20:DRAWTO I,10:NEXT I:FOR
I=10 TO 19-LV:PLOT 70,I:DRAWTO 100,I:N
EXT I:FOR I=75 TO 105:PLOT I,10
4028 DRAWTO 90,35:NEXT I:FOR I=85+LV T
O 95-LV:PLOT I,28:DRAWTO I,75:NEXT I:F
OR I=86+LV TO 100-LV
4030 PLOT I,75:DRAWTO I+48,15:NEXT I:F
OR I=136 TO 144:PLOT I,16:DRAWTO I,50:
NEXT I:FOR C=0 TO 360 STEP 3
4040 PLOT 140,60:DRAWTO 140+SIN(C)*18,
60+COS(C)*18:NEXT C:COLOR 1:PLOT 100,4
5:DRAWTO 100,58
4045 COLOR 1:PLOT 130,70:DRAWTO 140,60
:DRAWTO 150,70:PLOT 136,50:DRAWTO 136,
58:PLOT 143,50:DRAWTO 143,58
4047 COLOR 2:PLOT 136,57:DRAWTO 143,57
4050 FOR C=0 TO 360 STEP 12:PLOT 140,6
5:COLOR INT(RND(0)*3)+1:DRAWTO 140+SIN
(C)*6,65+COS(C)*6:NEXT C
4060 COLOR 2:PLOT 64,57:DRAWTO 64,59:P
LOT 65,56:DRAWTO 65,58:PLOT 66,57:DRAW
TO 66,59
4090 COLOR 2:PLOT 91,59:DRAWTO 102,59:
PLOT 91,70:DRAWTO 106,70
4100 POKE 752,1:? CHR$(125):? "MISSION
 X"
4110 RESTORE 11200:FOR II=1 TO 74:READ
 XX:PRINT CHR$(XX);:NEXT II:?
4120 FOR I=1662 TO 1717:READ X:POKE I,
X:NEXT I
4990 REM P/M SETUP
5000 X0=58:X1=58:Y0=30:Y1=37:YM0=197:Y
M1=207:XM0=188:POKE HPOSP0,62:POKE HPO
SP1,5:POKE HPOSM0,188
5040 A=PEEK(RAMTOP)-24:POKE PMBASE,A:M
YPMBASE=256*A:POKE GRACTL,3:POKE SDMCT
L,62:POKE PCOLR0,0:POKE PCOLR1,0
5050 V=A+3:P0=V+1
5230 P1=V+2:RES=USR(1612,V)
5250 DATA 12,63,45,33,63,30,51,33,33
5255 RESTORE 5250
5260 FOR I=MYPMBASE+1024+Y0 TO MYPMBAS
E+1032+Y0:READ A:POKE I,A:NEXT I
5275 DATA 12,12,30,30,30,51,45,33,33
5280 FOR I=MYPMBASE+1280+Y1 TO MYPMBAS
E+1288+Y1:READ A:POKE I,A:NEXT I
5290 DATA 3,3,3,3,3,3,0,0,0,0,12,12,12
,12,12,12,12,12,12,12,12,12
5295 FOR I=MYPMBASE+768+YM0 TO MYPMBAS
E+789+YM0:READ A:POKE I,A:NEXT I
5300 FOR I=MYPMBASE+1612 TO MYPMBASE+1
659:READ A:POKE I,A:NEXT I:RETURN
5310 DATA 2,31,2,0,0,0,0,0,0,0,0,0,0,0
,0,0,0,0
5315 DATA 0,0,0,0,0,0,0,0,0,0,0,0,0,0,
0,2,31,2
5320 DATA 0,0,0,0,0,0,0,0,0,0,0,0,0,0,
0,2,31,2
5990 REM LANDED ROUTINE
6000 FOR W=1 TO 30:NEXT W:FOR I=1 TO 1
440 STEP 13:COLOR 2:SOUND 0,I*I/500,8,
8:PLOT 140,65
6005 DRAWTO 140+SIN(I)*I/240,65+COS(I)
*I/240:NEXT I:POKE 708,66
6010 FOR I=1 TO 16:POKE 709,I*15+10:FO
R W=1 TO (17-I)*13:NEXT W:NEXT I:POKE
710,100:COLOR 1
6020 FOR I=1 TO 1440 STEP 26:PLOT 140,
65
6050 DRAWTO 140+SIN(I)*I/240,65+COS(I)
*I/240:NEXT I:POKE 19,0:SOUND 3,16*(15
-PEEK(19)),10,8
6055 COLOR 0:FOR I=58 TO 45 STEP -1:PL
OT 100,I:DRAWTO 110,I:NEXT I
6060 COLOR 2:FOR I=10 TO 19:PLOT I,4:D
RAWTO I,I/6:NEXT I:COLOR 0:FOR I=0 TO
4:PLOT 19,I:DRAWTO 47,I:NEXT I
6200 B=1:POKE 1661,1:RETURN
9990 REM DETONATION ROUTINE
10000 FOR I=0 TO 3:SOUND I,0,0,0:NEXT
I:FOR P=1 TO 20:SOUND 0,P,8,15:NEXT P:
COLOR 3:FOR I=79 TO 0 STEP -15
10010 POKE 710,I:PLOT 140,65:DRAWTO 0,
I:NEXT I:POKE 710,0
10200 FOR I=0 TO 159 STEP 20:POKE 710,
I:PLOT 140,65:DRAWTO I,0:NEXT I:POKE 7
10,15:FOR I=256 TO 1 STEP -4
10210 SOUND 0,I,8,15:NEXT I
10350 FOR I=53248 TO 53253:POKE I,0:NE
XT I
10390 GRAPHICS 18:FOR I=1 TO 255:POKE
710,I:POKE 712,I:NEXT I
10400 SETCOLOR 2,0,15:SETCOLOR 4,0,15:
FOR I=15 TO 0 STEP -1:SOUND 0,1,8,I:FO
R W=1 TO (16-I)*8:NEXT W:NEXT I
10410 GRAPHICS 18:POSITION 1,5:? #6;"Y
OU HAVE BEEN":POSITION 2,7:? #6;"BLOWN
 TO HELL!":FOR T=1 TO 500:NEXT T
10420 POSITION 5,9:? #6;"and back":FOR
 T=1 TO 300:NEXT T:RUN
11000 REM INITIALISING SEQUENCE
11008 GRAPHICS 2:POSITION 5,1:? #6;"MI
SSION X":POSITION 8,5:? #6;"by":POSITI
ON 2,7
11009 ? #6;"david rawlings"
11010 POKE 710,0:POKE 752,1
11020 FOR W=1 TO 100:NEXT W
11030 TRAP 11030:POKE 710,0:POKE 752,1
:? "ENTER DIFFICULTY LEVEL (1 to 3)":I
NPUT DIF:IF DIF>3 OR DIF<1 THEN 11010
11070 DATA 104,104,104,133,205,104,104
,133,207,160,1,169,0,133,204,133,206,1
77,204,136,145,204,200,200,208,247,160
11071 DATA 1,177,206,136,145,206,200,2
00,208,247,96,104,104,104,133,205,104,
104,133,207,160,254,169
11072 DATA 0,133,204,133,206,177,204,2
00,145,204,136,136,208,247,160,254,177
,206,200,145,206,136,136,208,247,96
11073 DATA 104,104,104,133,205,162,0,1
60,255,169,0,133,204,169,0,145,204,136
,208
11074 DATA 249,232,138,24,169,01,101,2
05,133,205,160,255,224,4,208,234,96
11075 RESTORE 11070:FOR I=0 TO 111:REA
D A:POKE 1536+I,A:NEXT I
11090 FOR I=1 TO 100:NEXT I
11100 RETURN
11200 DATA 70,85,69,76,32,32,32,32,32,
32,32,48,26,18,24,18,24,18,24,18,24,18
,24,18,24,18,24,18,24,18,24,18,24,3,49
11201 DATA 48,48,32
11202 DATA 83,80,69,69,68,32,45,54,48,
1,18,19,18,19,18,19,18,19,18,19,18,19,
18,19,18,19,18,19,18,19,18,19,18
11204 DATA 4,54,48
11500 DATA 104,169,0,141,124,6,173,4,2
08,208,8,173,12,208,208,3,76,150,6,169
,1,141,124,6,165
11510 DATA 20,141,194,2,141,2,208,173,
125,6,240,18,173,10,210,141,193,2,173,
10,210,141,192,2,173
11520 DATA 10,210,141,199,2,96
```

Get it right!

LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
1	2953	2	3508	3	3564
4	871	9	4929	10	7876
12	17392	14	18788	15	19178
16	8527	30	20422	35	1498
40	18951	45	9495	46	1498
80	20952	90	18545	100	9569
180	2560	190	13376	200	7860
210	6688	220	12985	230	7165
235	19918	240	11815	245	6165
247	4487	250	2694	260	2696
270	1616	300	8883	337	1616
400	11520	480	1616	500	11799
504	8158	505	13613	515	10899
520	14379	522	14357	525	4255
990	3754	1000	12078	1020	5232
1030	1856	1040	9033	1100	9540
1110	9357	1113	13480	1115	1850
1120	15759	1125	4250	1130	20262
1140	13675	2000	9551	2010	14855
2015	10999	2017	2842	2020	2915
2070	3760	2100	13014	2135	10099
3990	5277	4000	5407	4002	4026
4003	9423	4005	15528	4007	18144
4008	3576	4010	19156	4012	10408
4015	20182	4017	18936	4020	6747
4026	19280	4028	17089	4030	18815
4040	15822	4045	17918	4047	6114
4050	17191	4060	14978	4090	10551
4100	9903	4110	11784	4120	7704
4990	2631	5000	17354	5040	20729
5050	2085	5230	4290	5250	4831
5255	2298	5260	12640	5275	4755
5280	12712	5290	8876	5295	12718
5300	12996	5310	6021	5315	6021
5320	6021	5990	3787	6000	15124
6005	10549	6010	15266	6020	6148
6050	15211	6055	11602	6060	19618
6200	4185	9990	4822	10000	18594
10010	9545	10200	17851	10210	4102
10350	6689	10390	10230	10400	19011
10410	19716	10420	10823	11000	5320
11008	15803	11009	5199	11010	3772
11020	3922	11030	20304	11070	16149
11071	14071	11072	15830	11073	11262
11074	10189	11075	10421	11090	3880
11100	1498	11200	16276	11201	2261
11202	15545	11204	2080	11500	12939
11510	13543	11520	4028		

Life in the fast lane



ERNIE LITTLE shows how to keep your motoring bills down

THIS month's program is designed to help you keep track of your petrol consumption.

It enables you to work out your current consumption in miles per gallon and compare it with previous values. The current and the last nine values calculated are displayed on an easy-to-read table.

By keeping track of the petrol used you can see whether the engine requires tuning – the petrol consumption will increase as the car approaches its next service.

Enter and run the program. You'll be asked if you wish to load the previous results. The first time you run the program the answer will of course be N.

Next you'll be asked if you wish to calculate your current petrol consumption.

Enter the number of miles covered at the first prompt and the amount of petrol used at the second.

After displaying this the table is drawn showing the current mpg first followed by the previous nine.

Finally you have the opportunity to save the table data to disc. Unfortunately saving the data to tape would be slow so the program is designed for disc only.

```
10 REM MPG CALCULATOR
20 REM BY ERNIE LITTLE
30 REM (c) ATARI USER
40 DIM MPG(10)
50 FOR I=1 TO 10:MPG(I)=0:NEXT I
60 GRAPHICS 0:SETCOLOR 2,0,0:POKE 752,
1
70 POSITION 6,1:? "MILES PER GALLON CA
LCULATOR"
75 POSITION 6,2:? "-------------------
--------"
80 POSITION 6,4:? "LOAD PREVIOUS MPG'S
 (Y/N).."
90 OPEN #1,4,0,"K:"
100 GET #1,KEY:IF KEY=89 THEN GOTO 120
105 IF KEY=78 THEN GOTO 160
110 IF KEY<>89 OR KEY<>78 THEN GOTO 10
0
120 OPEN #2,4,0,"D1:DATA"
130 FOR I=1 TO 10
140 INPUT #2,N:MPG(I)=N
145 NEXT I
150 CLOSE #2
160 ? CHR$(125)
170 POSITION 3,1:? "CALCULATE NEW MPG'
S..."
180 FOR I=10 TO 2 STEP -1
190 MPG(I)=MPG(I-1)
200 NEXT I
210 POSITION 3,4:? "HOW MANY MILES";
215 INPUT M
220 POSITION 3,6:? "HOW MUCH PETROL";
225 INPUT P
230 MPG(1)=INT(M/P)
235 POSITION 3,8:? "MPG = ";MPG(1)
240 FOR DE=1 TO 1000:NEXT DE
300 ? CHR$(125):POSITION 12,0:? "MPG'S
 SAVED ON DISC"
310 FOR I=1 TO 10
320 ? "(";I;")";"  ";MPG(I)
330 ?
340 NEXT I
350 ? "     PRESS ANY KEY TO CONTINUE"
355 ? "       AND SAVE NEW DATA..."
360 GET #1,KEY:IF KEY=32 THEN GOTO 500
370 IF KEY<>32 THEN 360
490 GOTO 490
500 OPEN #2,8,0,"D1:DATA"
510 FOR I=1 TO 10
520 N=MPG(I)
530 PRINT #2,N
540 NEXT I
550 CLOSE #2
560 ? CHR$(125)
570 RUN
```

Get it right!

LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
10	3720	20	3978	30	3383
40	1840	50	5453	60	6952
70	8936	75	6864	80	8563
90	2690	100	6482	105	4529
110	6503	120	3714	130	2269
140	3873	145	1345	150	1563
160	1737	170	7634	180	3370
190	2792	200	1345	210	6494
215	1536	220	6763	225	1545
230	2930	235	5502	240	4360
300	8999	310	2269	320	3468
330	254	340	1345	350	6038
355	4696	360	6454	370	3571
490	1641	500	3734	510	2269
520	1613	530	1871	540	1345
550	1563	560	1737	570	923

PART 2

Speech Synthesiser:

LEN GOLDING gives you the software for last month's DIY voice box

MEANINGFUL speech can be generated from 64 different sounds, known as allophones. Let's see how we can program the voice box you produced last month to generate these sounds and string them together to produce any word in the English language.

Programming the box is just a matter of sending the appropriate code numbers in correct sequence.

The full allophone set with descriptions of the sounds produced by each code is shown in Table II. These are only approximate, since the allophones will often behave differently when they are used at different positions in real words.

Where possible, the examples show each allophone in its most usual position. For example, an initial D is best produced by code 33, while code 21 sounds better at the end of a word. Characters at the end of words are shown by, for example, –D.

Allophones marked with asterisks can be used twice in succession to provide longer sounds or emphasis. For example, the S sound (55) can be short, as in Sit or longer, as in Hiss.

Some consonant sounds – P (9), B (28,63), T (13), D (33), K (8,41,42), G (36,61), CH (50) and J (10) – need a brief pause before them. Some silence has already been built-in to these allophones, but you can add more by using the pause codes (0 to 4). These pauses can also be used to separate words and sentences.

In most cases you will need to try several alternatives before hitting on the right sound combination for your chosen word. For example, the 0 sound in computer can be produced by allophone 24 (0 as in hot). But number 23 sounds just as good, even though it is supposed to generate AW as in aught.

As you might expect, the synthesiser has a slight American accent. This is most noticeable for words ending in ER, ORE and ARE, but also colours some of the vowel sounds.

Program I shows an easy way of stringing allophones together to produce the word computer. To insert your own words simply change the data at line 80. This is straightforward, and keeps programming to a minimum. But long strings of numbers are tricky to work with, and it's almost impossible to tell what word is being represented making fault-finding tedious.

Program II makes the job easier. It allows you to select any allophone by typing a single Ascii letter, which loosely corresponds to the sound produced. For example, the letter A will generate allophone 26 – A as in hat. The translator routine is in machine code for speed.

Your desired word starts as an Ascii string (line 130), and is sent to the machine code routine one letter at a time, via the USR function (line 140). This routine translates the Ascii letter into its corresponding allophone code and puts the result into address 1791. Lines 160 to 180 retrieve this and send it to the voice box as in Program I.

The allophone-to-Ascii conversion data for Program II are at Table I. To use this, first find the required sound by examining the sample words. The left hand column tells you which letter

Program I

```
10 POKE 54018,56:POKE 54016,255:POKE 5
4018,60:REM set up ports for output
20 READ D:IF D=-1 THEN END
30 POKE 54016,D+128:REM send code with
 strobe line high
40 IF PEEK(644)=1 THEN 40:REM wait for
 "ready" signal
50 POKE 54016,D:POKE 54016,D+128:REM p
ulse strobe low then high again
60 GOTO 20
70 REM The following codes produce "CO
MPUTER"
80 DATA 42,23,16,9,49,22,13,51,0,-1
```

Get it right!

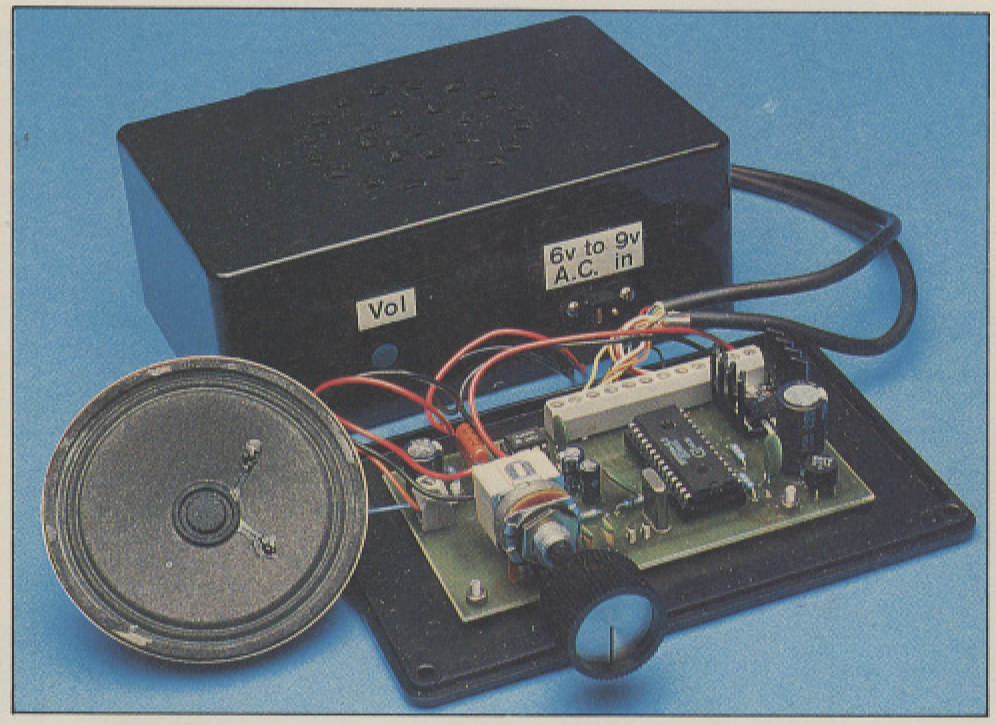
LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
10	14864	20	4681	30	12668
40	11090	50	15214	60	1418
70	10379	80	4934		

Program II

```
10 POKE 54018,56:POKE 54016,255:POKE 5
4018,60:POKE 54016,0:REM set up ports
fpr output
20 DIM A$(100):REM maximum number of a
llophones - change this to suit yourse
lf
30 FOR X=0 TO 170:READ D:POKE 1536+X,D
:NEXT X:REM insert 'translator' routin
e
40 DATA 104,104,104,201,48,144,61,201,
53,176,5,56,233,47,16,54,201,65,144,48
50 DATA 201,91,176,5,56,233,59,208,41,
201,97,144,35,201,123,176,5,56,233,65
60 DATA 208,28,201,193,144,22,201,219,
176,5,56,233,135,208,15,201,239,144,9,
201
70 DATA 246,176,5,56,233,155,208,2,169
,0,170,189,80,6,141,255,6,160,1,96
80 DATA 255,0,1,2,3,4,26,63,8,33,7,40,
36,27,12,10,42,45,16,56
90 DATA 24,9,0,15,55,14,15,35,46,0,25,
43,59,28,50,21,19,0,61,57
100 DATA 6,0,41,62,0,11,53,0,0,39,37,1
8,22,0,48,0,49,38,20,0
110 DATA 0,0,52,0,34,51,0,0,0,0,0,44,2
3,0,0,60,0,54,30,0
120 DATA 32,0,5,0,58,0,0,47,0,29,31
130 INPUT A$:REM allophone string, in
ASCII form
140 FOR X=1 TO LEN(A$):Z=USR(1536,ASC(
A$(X,X))):V=PEEK(1791)
150 V=PEEK(1791):REM correct allophone
 code, translated from ASCII form
160 POKE 54016,V+128:REM send code wit
h strobe high
170 IF PEEK(644)=1 THEN 170:REM wait f
or "ready" signal
180 POKE 54016,V:POKE 54016,V+128:REM
pulse strobe line low, then high again
190 NEXT X
200 FOR W=1 TO 50:NEXT W:REM short pau
se at end of speech
210 POKE 54016,0:POKE 54016,128:REM tu
rn sound off
220 GOTO 130
```

Get it right!

LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
10	16898	20	19444	30	17125
40	11055	50	10916	60	11473
70	10687	80	8828	90	9190
100	8446	110	7675	120	4742
130	11256	140	10025	150	17516
160	11426	170	11114	180	16689
190	1375	200	12700	210	9681
220	1617				



will produce this sound, and the top row shows whether it should be upper or lower case, normal or inverse. For example, OY is produced by an inverse uppercase Y, and –B by a normal lowercase b.

Although this system cannot interpret real words, the Ascii string will usually be recognisable, which makes it much easier to find your place in a large block of text.

Don't be discouraged if your first attempts produce unintelligible hisses and grunts. A couple of hours experimentation will show you which allophones go best together, and you should soon be able to produce speech that anyone can recognise.

Table I: Allophone-to-Ascii convertor for use with Program II

		Normal lower case	Inverse upper case	Inverse lower case
A	hAt	alARm	trAY	
B	Beast	riB		
C	Comb	CHurch		
D	Do	playeD		
E	End	sEE	lettER	
F	Food			
G	Give	Girl	peG	
H	He	Hoe	bIRd	
I	sIt	skY		
J	doDGE			
K	Kitten	speaK		
L	Lake	saddLE		
M	Milk			
N	No	thiN	aNGer	
O	hOt	Over	Aught	stORe
P	Pow			
Q	Note 1			
R	Read	bRain	cleaR	stARE
S	veSt	SHip		
T	To	parT	THey	THin
U	sUcceed	compUte	bOOk	fOOd
V	Vest			
W	Wool	WHite	OUt	
X	Note 2			
Y	Yes	cUte	bOY	
Z	Zoo	aZUre		
0	10 millisecond pause			
1	30 millisecond pause			
2	50 millisecond pause			
3	100 millisecond pause			
4	200 millisecond pause			

Note I: For Q use C+W or K+W
Note II: For X use Z or C+S or K+S

Table II: Allophone set for speech synthesiser

Code	Sound	Example
0	10 millisecond pause	
1	30 millisecond pause	
2	50 millisecond pause	
3	100 millisecond pause	
4	200 millisecond pause	
5	OY	Boy
6	AYE	Sky
7	EH *	End
8	K	Comb
9	PP	Pow
10	J	Dodge
11	NN	Thin
12	I *	Sit
13	T	To
14	R	Read
15	UH *	Succeed
16	M	Milk
17	TT	Part
18	TH	They
19	EE	See
20	AY	Tray
21	DD	Played
22	YU	Compute
23	AW *	Aught
24	O *	Hot
25	Y	Yes
26	A *	Hat
27	H	He
28	BB	Rib
29	TH *	Thin
30	U *	Book
31	OO	Food
32	OW	Out
33	D	Do
34	GG	Peg
35	V	Vest
36	G	Give
37	SH	Ship
38	ZH	Azure
39	-R	Brain
40	F *	Food
41	CK	Speak
42	K	Kitten
43	Z	Zoo
44	NG	Angry
45	L	Lake
46	W	Wool
47	AIR	Repair
48	WH	White
49	–Y	Cute
50	CH	Church
51	UR	Bird
52	ER	Letter
53	OH	Over
54	TH	They
55	S *	Vest
56	N	No
57	HH	Hoe
58	OR	Store
59	AR	Alarm
60	EAR	Clear
61	G	Girl
62	LL	Saddle
63	B	Beast

** These allophones can be doubled to make longer sounds for stressed syllables.*

VERY HIGH QUALITY VERY LOW PRICES

5.25" COMPUTER DISKS - BULK PACKED - TOP QUALITY

QTY	SS 48TPI	SS 96TPI	DS 48TPI	DS 96TPI	DS 48 C/R	DS 96 C/R
10	£5.95	£6.95	£6.95	£7.95	£8.95	£9.95
25	£10.99	£11.99	£11.99	£12.99	£14.99	£17.99
50	£19.99	£20.99	£20.99	£21.99	£27.99	£32.99
100	£36.99	£37.99	£37.99	£41.99	£45.99	£57.99
150	£52.99	£55.99	£55.99	£57.99	£63.99	£80.99
250	£85.99	£87.99	£87.99	£91.99	£103.99	£126.99

C/R = Coloured or reversible disks - reversible disks have two holes and two notches! Boxes of 10 disks are supplied in plastic cases (worth £1.49).

These disks are packed with a protective jacket (envelope) and come with a full user set, including a label and a write protect tab. The disks are manufactured to top international standards and have a hub ring for added protection.

3.5" COMPUTER DISKS - BULK PACKED - with labels etc . . .

QTY	SS 135TPI	DS 135TPI
10	£14.95	£16.95
25	£29.95	£35.95
50	£55.95	£62.95
100	£105.95	£119.95
150	£149.95	£169.95
250	£239.95	£269.95

STORAGE BOXES

THE BEST RANGE!

Lockable Storage Boxes from Centec

3.00" Lockable–Holds 60	£9.95
3.50" Lockable–Holds 40	£7.99
3.50" Lockable–Holds 90	£9.95
5.25" Lockable–Holds 50	£7.99
5.25" Lockable–Holds 100	£9.95

COMPUTER MONITORS – FULL RANGE STOCKED – BEST PRICES!

Philips CM 8533/CM 8833 – Colour Monitor IRGB for Nimbus/BBC etc	£269.95
Philips CM 8852 – Colour/RGB/TTL/Linear Inputs	£299.95
Philips BM 7502 – High Res Green Screen Monitor – Composite	£79.95
Philips BM 7522 – High Res Amber Screen Monitor – Composite	£89.95
Philips BM 7542 – High Res White Screen Monitor – Composite	£89.95
Microvitec 1431 – Standard Resolution Colour Monitor	£179.95
Microvitec 1451 – Medium Resolution Colour Monitor	£229.95
Microvitec 1441 – High Resolution Colour Monitor	£379.95

REMEMBER – All Monitors are delivered free by Securicor! No extras to pay!

CENTEC ELECTRONIC SYSTEMS LTD
UNIT 3, THE METRO CENTRE
BRIDGE ROAD, ORPINGTON
KENT BR5 2BE
TEL: (0689) 61947/62103 (24 hours)

Remember - all prices include VAT and delivery ! There are no hidden extras to pay!

ATARI DISCOUNTS

ATARI 400/800 CASSETTES

Electra Glide	English Software	£3.95
Aztec	Databyte	£3.95
Mr. Robot	Databyte	£3.95
Knockout	Anco	£3.95
Nightraiders & Ardyaardvark	Databyte	£3.95
Cohens Towers & Cosmic Tunnels	Databyte	£3.95
Atari Smash Hits Vol. 2	English Software	£3.95
Kingdom	Atari	£4.95
Blackjack	Atari	£4.95
Hangman	Atari	£4.95
The Lone Raider	Atari	£4.95
Shooting Arcade	Datasoft	£4.95
Tail of Beta Lyrae	Databyte	£3.95
Montezuma's Revenge	Databyte	£3.95
Football Manager	Addictive	£3.95
Boulderdash Construction Kit	Databyte	£6.95

ATARI 400/800/1200 CARTRIDGES

Rally Speedway	Adventure International	£7.95
Qix	Atari	£5.95
Super Breakout	Atari	£5.95
Mountain King	L.B.S	£5.95
Miner 2049 ER	Big Five Software	£5.95

ATARI 400/800 DISC & CASSETTE

Rosens Brigade	Gentry	£5.95
Sea Bandit	Gentry	£5.95
Zaxxon	Datasoft	£5.95

ATARI 400/800 DISCS

Maxwells Demon & Memory Mania	Gentry	£5.95
Nibbler	Datasoft	£5.95
Clowns & Balloons	Datasoft	£5.95
Juno's First	Datasoft	£5.95
Pooyan	Datasoft	£5.95

ATARI ST SOFTWARE

Terrestrial Encounters	Solar Software	£7.95

ATARI 2600 CARTRIDGES

Star Raiders (with touch pad)	£6.95
Defender	£6.95
Yars Revenge	£5.95
Robot Tank	£9.95
Pitfall II	£9.95
Space Shuttle	£9.95
Hero	£9.95
Warlord	£5.95
Breakout	£5.95
Boing !!	£8.95
Superbreakout	£5.95
Outlaw	£5.95
Racquetball	£7.95
Skeet Shot	£7.95
Space Cavern 48	£7.95

Access and Visa welcome
P&P 1-3 Titles 75p 4 or more £1.00
Overseas £1.20 for each title
Cheques payable to

Logic Mail Order Ltd.
17 Leofric Square Eastern Industry
Peterborough Cambs. PE1 5TN
24 Hr Ordering Service on
0733 - 313870
Allow 7-10 days delivery

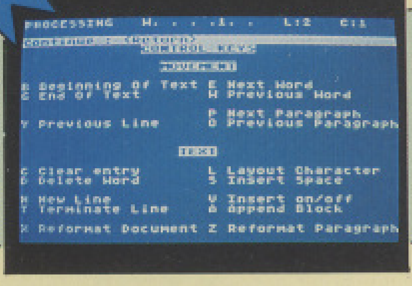
ATARI USER MAIL ORDER OFFERS

ATARI USER MAIL ORDER OFFERS

Look no further for a super word processor

Save £10

Superscript Word processor, five-function calculator, mailing list and spelling checker with 20-30,000 word expandable dictionary – all in one complete package.



Features include:

- Fully menu-driven – with shortcut commands
- Cut and paste plus full search and replace
- Centre, justify, enbolden and underline text
- Add headers and footers
- Variable auto page numbering
- 225 page manual with step-by-step tutorial

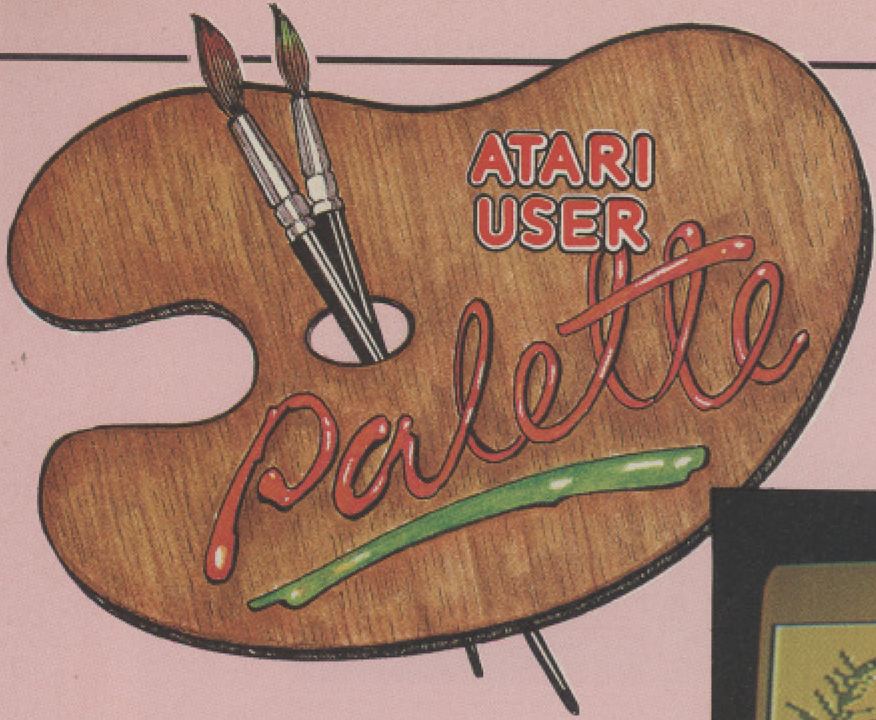
Advanced features:

- Introduce whole passages and perform entire sequences of commands with a single keypress
- Interactive calculator, row and column arithmetic
- Auto-number tab storage, column moving, up to 240 column editing screen
- Supports all main printer types, and can be customized to suit your printing requirements

Everything on one double-sided disc!

Normal retail price £39.95
Special offer price . . . £29.95

TO ORDER PLEASE USE THE FORM ON PAGE 61



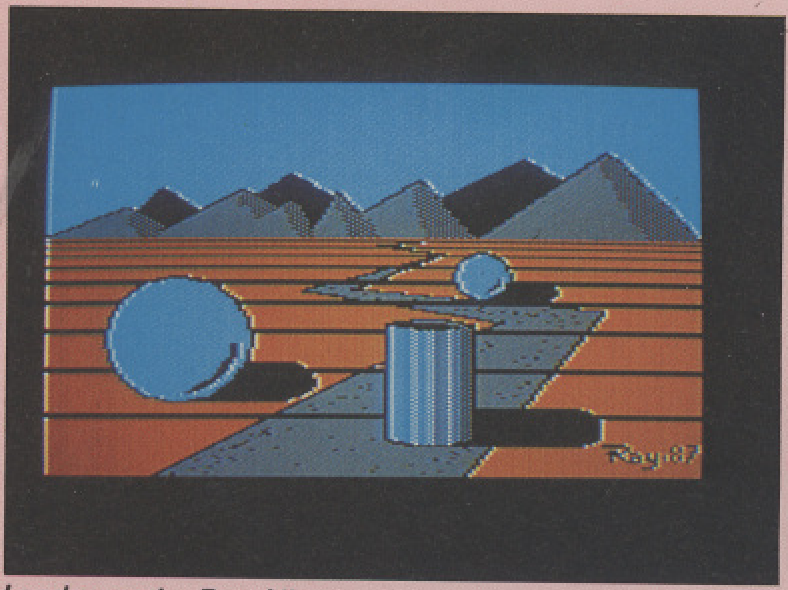
THE pictures are still flooding in. This month we feature efforts from Ray Allen, Martin Ribbink and Anon.

If you would like to see your masterpieces in print, send them to: Palette, *Atari User*, Europa House, 68 Chester Road, Hazel Grove, Stockport, SK7 5NY.

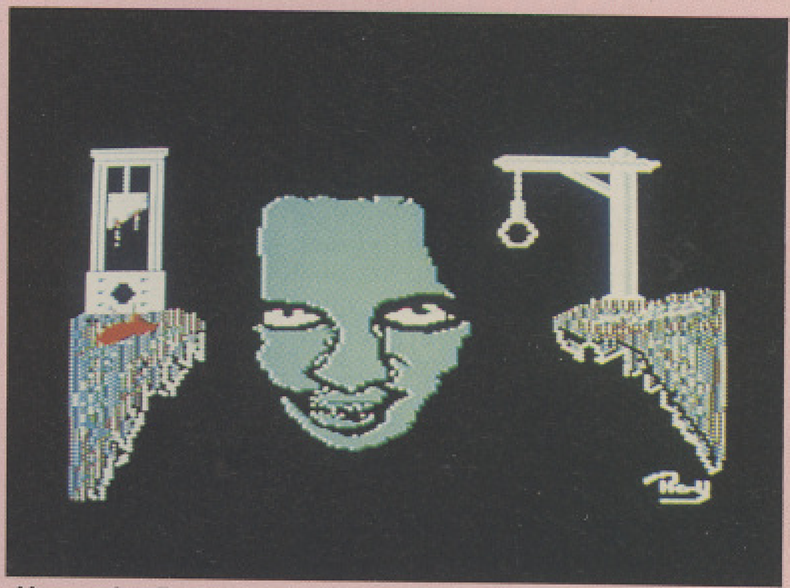
We don't mind whether you send one picture or 100. If they're good we'll print them – But remember to enclose your name and address.



Dino by Martin Ribbink



Landscape by Ray Allen



Horror by Ray Allen



Ferrari by Anon



Logo by Anon



Psychedelic Journey

A colourful extravaganza from STEPHEN WILLIAMSON

IN the sixties pop groups such as Pink Floyd and Genesis used light to dramatic effect. At the back of the auditorium banks of slide and cine projectors threw images on to a giant screen behind the band.

Swirling patterns of colour were created by a technique using coloured oil that moved as if alive. Kaleidoscopes created symmetrical patterns of moving colour, while cine projectors provided images of candle flames or trails of speeded up car lights.

By today's standards the techniques used were primitive. Using computer graphics it is now possible to integrate music and light images in a far more flexible and spectacular way.

Perhaps the state of the art in computer light shows is Colourspace, described by its writer Jeff Minter as a light synthesiser. On the 8 bit Atari computer Colourspace is very impressive, especially when it's linked to synthesiser music.

Although Psychedelic Journey is nowhere near as spectacular as Colourspace, it creates intriguing, hypnotic graphics that can be used to accompany your favourite music.

When you first run the program a series of symmetrical shapes are displayed on the screen. Colour rotation animation gives the illusion of movement. To change the display use the keys shown in Table I and to draw shapes use the keys in Table II.

The best way to use the program is to experiment with the various options. Mix shapes, colours and rotation directions to create various effects.

The program is liberally sprinkled with rem statements, so you should have no difficulty in working out how it works. Why not try changing the program to create other effects?

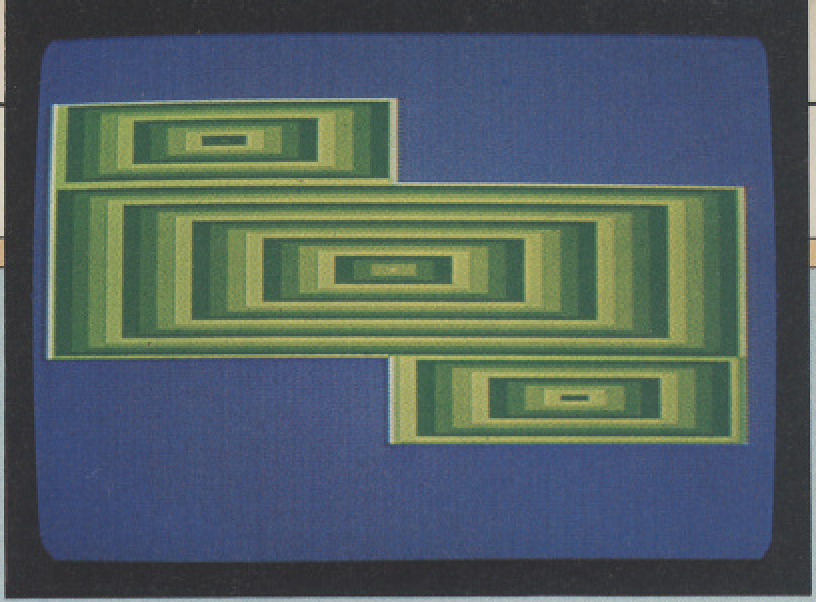
So turn the lights down low, the stereo up high and run the program to enjoy a Psychedelic Journey.

A	Switches on and off the automatic colour change sequence which changes the colours to a random value every few seconds. With this feature switched off you have to make your own colour changes.
B	Cycles through the 128 available background colours.
Shift+B	Performs the same operation as pressing B, but the colours cycle in the opposite order.
C	Changes the foreground colours in a random way.
Shift+C	Changes to a single colour.
D	Switches on a display list interrupt routine that puts lines of shimmering colours on to the screen to give a dazzle effect. This is best seen if you change the colour to grey using Shift+C before pressing D.
E	Erases the current display.
S	Increases the speed of colour rotation.
Shift+S	Decreases the speed of colour rotation.
+ and *	Change the direction of colour rotation in and out. They should be used before drawing a new shape.

Table I: Display control keys

1	Medium wide ratio – top left hand corner
2	Medium wide ratio – top right hand corner
3	Medium wide ratio – left bottom corner
4	Medium wide ratio – right bottom corner
5	Medium wide ratio – centre of display.
6	Large wide ratio – centre of screen
7	Large standard ratio – full screen.
8	Medium standard ratio – centre of screen.
9	Draws 15 small wide ratio shapes.
0	Draws 15 small standard ratio shapes.

Table II: Shape control keys



```
10 REM ******************************
15 REM ***  PSYCHEDELIC JOURNEY  ***
20 REM *** BY STEPHEN WILLIAMSON ***
25 REM ***    (c)ATARI USER      ***
30 REM ******************************
36 REM
37 REM
38 REM INITIALISATION
40 GRAPHICS 10+16
50 COL=8:DAZ=0:DEL=10:AUTO=1:BACK=0
60 FOR I=1 TO 8
70 POKE 704+I,17+I:REM SET-UP VALUE OF
 STARTING COLOURS
80 POKE 704,BACK:REM SET SCREEN TO BLA
CK
90 NEXT I
100 GOSUB 690
110 REM INITIALISE START DESIGN
120 KEY=94:D=1:GOSUB 830
130 KEY=117:GOSUB 830
140 KEY=51:D=0:GOSUB 830
150 KEY=27:D=1:GOSUB 830
160 KEY=29:D=0:GOSUB 830
170 GOTO 280
180 REM DRAW DESIGN
190 FOR X=Y TO 0 STEP -1
200 PLOT X+H,S*X+V:DRAWTO X+H,S*(Y-X)+
V
210 DRAWTO H+Y-X,S*(Y-X)+V
220 IF D=0 AND X>=Y/2+1 THEN COL=COL+1
:IF COL>8 THEN COL=1
230 IF D=0 AND X<Y/2+1 THEN COL=COL-1:
IF COL<1 THEN COL=8
240 IF D=1 AND X>Y/2+1 THEN COL=COL-1:
IF COL<1 THEN COL=8
250 IF D=1 AND X<Y/2+1 THEN COL=COL+1:
IF COL>8 THEN COL=1
260 COLOR COL:A=USR(1560):A=USR(1560)
270 NEXT X:RETURN
280 REM ROTATE COLOURS
290 A=USR(1560)
300 KEY=PEEK(764):IF KEY<>255 THEN GOS
UB 340
310 A=USR(1560):FOR X=0 TO DEL:NEXT X
320 IF AUTO=1 THEN REP=REP+1:IF REP=60
 THEN REP=0:GOSUB 620
330 GOTO 280
340 REM CHANGE PARAMETERS
350 IF KEY=63 AND AUTO=0 THEN AUTO=1:K
EY=255:REP=59:REM KEY A = AUTO DEMO
360 IF KEY=63 AND AUTO=1 THEN AUTO=0:K
EY=255
370 IF KEY=58 THEN DAZE=1:REM KEY D =
DAZZLE
380 IF DAZE=1 AND DAZ=1 THEN POKE 5428
6,64:DAZ=0:DAZE=0:REM TURN OFF DLI
390 IF DAZE=1 AND DAZ=0 THEN POKE 5428
6,192:DAZ=1:DAZE=0:REM TURN ON DLI
400 IF KEY=62 THEN DEL=DEL-2:IF DEL<0
THEN DEL=1:REM KEY 'S' = SPEED UP
410 IF KEY=126 THEN DEL=DEL+2:REM KEY
'SHIFT/S' = SPEED DOWN
420 IF KEY=7 THEN D=0:REM KEY '*' =
ROTATE OUT
430 IF KEY=6 THEN D=1:REM KEY '+' =
ROTATE IN
440 IF KEY=18 OR KEY=82 THEN GOSUB 550
:REM 'KEY C' & 'SHIFT/C' =  CHANGE
COLOUR
450 IF KEY=42 THEN GRAPHICS 10:GOSUB 6
90:REM KEY 'E' = ERASE SCREEN
460 IF KEY=85 THEN BACK=BACK-2:IF BACK
<0 THEN BACK=255:REM KEY 'SHIFT/B ' =
 SCREEN COLOUR DOWN
470 IF KEY=21 THEN BACK=BACK+2:IF BACK
>255 THEN BACK=0:REM KEY 'B' = SCREEN
COLOUR UP
480 IF KEY>23 AND KEY<32 THEN GOSUB 83
0
490 IF KEY<56 AND KEY>47 THEN GOSUB 83
0
500 IF KEY<120 AND KEY>111 THEN GOSUB
830
510 IF KEY>87 AND KEY<96 THEN GOSUB 83
0
520 POKE 704,BACK
530 KEY=255:POKE 764,255:RETURN
540 REM CHANGE COLOURS
550 IF KEY=82 THEN COL=COL+1:IF COL=16
 THEN COL=0
560 FOR I=8 TO 0 STEP -1
570 IF KEY=18 THEN POKE 705+I,INT(RND(
0)*256):REM KEY C = RANDOM COLOURS
580 IF KEY=82 THEN POKE 705+I,COL*16+I
+2:REM KEY SHIFT/C = SINGLE COLOUR
590 NEXT I
600 RETURN
610 REM AUTO DEMO
620 RAND=INT(RND(1)*3):BACK=BACK+2:IF
BACK>255 THEN BACK=0
630 POKE 704,BACK
640 IF RAND=0 THEN KEY=18
650 IF RAND=1 THEN KEY=82
660 IF RAND=2 THEN KEY=58
670 GOSUB 350:RETURN
680 REM SET UP DLI ROUTINE
690 RESTORE :DL=PEEK(560)+PEEK(561)*25
6
700 FOR L=DL+6 TO DL+192 STEP 4:POKE L
,15+128
710 NEXT L
720 FOR L=1536 TO 1536+17:READ A:POKE
L,A:NEXT L
730 POKE 512,0:POKE 513,6
740 REM READ COLOUR ROTATE DATA
750 FOR L=1560 TO 1580:READ A:POKE L,A
:NEXT L
760 RETURN
770 REM DISPLAY LIST INTERRUPT
780 REM MACHINE CODE DATA
790 DATA 72,24,173,203,2,105,2,141,10,
212,141,23,208,141,203,2,104,64
800 REM ROTATE COLOURS
810 REM MACHINE CODE DATA
820 DATA 104,172,193,2,162,0,189,194,2
,157,193,2,232,224,9,208,245,140,200,2
,96
830 REM SHAPE DATA
840 IF KEY=31 THEN Y=39:V=6:H=0:S=1
850 IF KEY=30 THEN Y=39:V=6:H=39:S=1
860 IF KEY=26 THEN Y=39:V=124:H=0:S=1
870 IF KEY=24 THEN Y=39:V=124:H=39:S=1
880 IF KEY=29 THEN Y=39:V=66:H=19:S=1
890 IF KEY=27 THEN Y=78:V=46:H=0:S=1
900 IF KEY=51 THEN Y=78:V=6:H=0:S=2
910 IF KEY=53 THEN Y=39:V=47:H=19:S=2
920 IF KEY=95 THEN Y=24:V=2:H=0:S=2
930 IF KEY=94 THEN Y=24:V=2:H=27:S=2
940 IF KEY=90 THEN Y=24:V=2:H=54:S=2
950 IF KEY=88 THEN Y=24:V=61:H=0:S=2
960 IF KEY=93 THEN Y=24:V=61:H=27:S=2
970 IF KEY=91 THEN Y=24:V=61:H=54:S=2
980 IF KEY=115 THEN Y=24:V=120:H=0:S=2
990 IF KEY=117 THEN Y=24:V=120:H=27:S=
2
1000 IF KEY=112 THEN Y=24:V=120:H=54:S
=2
1010 IF KEY<>48 AND KEY<>50 THEN GOSUB
 180:RETURN
1020 IF KEY=48 THEN Y=24:S=1:FOR H=3 T
O 53 STEP 24:FOR V=25 TO 125 STEP 25:G
OSUB 180:NEXT V:NEXT H
1030 IF KEY=50 THEN Y=24:S=2:FOR H=2 T
O 53 STEP 25:FOR V=10 TO 125 STEP 25:G
OSUB 180:NEXT V:NEXT H
1040 RETURN
```

Get it right!

LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
10	4441	15	6098	20	6281
25	5376	30	4441	36	871
37	871	38	3892	40	2731
50	6280	60	2098	70	10354
80	7074	90	1345	100	1928
110	5745	120	3911	130	3175
140	3900	150	3910	160	3913
170	1634	180	2986	190	3616
200	6759	210	4378	220	9949
230	9671	240	9681	250	9664
260	6302	270	3194	280	3900
290	2021	300	7475	310	6425
320	10672	330	1634	340	4342
350	13714	360	7723	370	8001
380	13204	390	13192	400	12051
410	10729	420	8021	430	7558
440	14343	450	12127	460	17608
470	15419	480	6507	490	6546
500	6773	510	6585	520	2485
530	5313	540	3801	550	8658
560	3502	570	13123	580	13380
590	1345	600	1498	610	2587
620	10018	630	2485	640	4128
650	4128	660	4142	670	3427
680	4543	690	6433	700	7294
710	1351	720	8032	730	3769
740	5376	750	7567	760	1498
770	5540	780	4020	790	9801
800	3900	810	4020	820	11347
830	2982	840	5797	850	5865
860	6085	870	6398	880	6138
890	5881	900	5818	910	6121
920	5798	930	5856	940	5833
950	5856	960	6080	970	6067
980	6402	990	6518	1000	6510
1010	8738	1020	17626	1030	17564
1040	1498				



Edit those hidden disc sectors

BRUCE WOODLAND offers his disc sector editor

DISC editor allows you to examine and alter any disc sector. The contents are displayed on screen both as an indexed hexadecimal table, and an Atascii dump. The latter is mainly useful in highlighting text content. A printer output is also provided.

The applications are limited only by your imagination and ingenuity. Minor changes to data and text of disc files is probably the most obvious serious application of the utility but there are many others.

Perhaps a few off-beat examples will stimulate your imagination. The Dos 2.5 system is not wholly bug free and will accept quite illegal disc LIST filenames, thereafter refusing to allow them to be altered or loaded. Minor operations on the directory sectors (such as 361) rapidly reclaim them.

For the unashamed cheat, try scanning the text of your disc based adventure games. You won't get all the answers, but you often find a fair number of clues.

The intellectual might try perusing sectors as an aid to learning how programs are tokenised, numbered, D:listed. and so on. A lot of information on how your computer functions, and how to get the best from it can be found in this way.

Much of the program is concerned with presenting the disc data in a satisfactory screen and printer layout. The heart is the disc sector read and write subroutines which are quite straight forward.

The CIO operating system call (Central Input/Output utility) is used and this carries out the disc read/writes when it is given the correct command codes and addresses. Since this is potentially very useful, these sections are especially well commented internally. The data is displayed in hexadecimal notation and user inputs (except the segment number) is expected in this form.

Hexadecimal is preferred by most machine code programmers and takes up less display space. Conversions between decimal and hexadecimal are handled by short machine code routines.

On first running the program you will be asked for a disc segment number. Provide this in normal decimal form from 1 to 719 for single density and up to 999 for enhanced. The sector content will be loaded into the string SECTOR$ and displayed on the screen.

A sector contains 128 bytes of data and the position of a particular byte in it can be determined from the index at top and sides of the sector dump.

This is hexadecimal with the figures on the left showing the high digit and the top ones the low. Once the sector has been displayed, you are provided with five menu options – View, Edit, Write, Print and Exit.

The View option allows another sector to be displayed and you are allowed the same options that you have just used.

If you select the Edit option you are prompted to supply the indexing code of the byte concerned. By simply cross referencing the inverse number on the left row with the inverse letter on the top row to give a hexadecimal code any byte displayed on the screen can be altered.

Once this code is provided the cursor will move to the selected byte and you simply supply the new value (in hexidecimal) and press Return. You may make as many changes as necessary before returning to the menu.

The changes are reflected in the Atascii display and the sector storage string but not on the disc so don't be afraid to experiment as no damage can be done to any disc unless you actually choose the write option and write faulty data to the disc.

The Write option causes the data displayed on screen to be written back to the sector concerned. You will be asked to verify this request. Failure to do so simply returns control to the menu. Be very careful about writing anything to the disc and make sure that you first have a backup copy.

The Print option is used to output sector data to a printer. The format of the data table is better than on screen

Turn to Page 49 ▶

Your HINTS & TIPS

Spellbound

HERE are some tips for Spellbound by Mastertronic.

● To get past the wall on the second floor collect the trumpet and the elf horn from the last screen on the first floor. Go to the wall, summon Elrand and command him to help. He will knock over the wall.

● To get past the tower collect the lumps of stone from either side of the wall once it has been knocked down. Position them in front of the tower and you will be able to jump over it.

● The crystal ball can be used to locate people except when you are in the lift.

● Tell Thor to sleep or he will die.

● You need the red herring and the power pong from the plant in the basement to cast the Furnaticas Protectium.

● Stand in the sticky liquid on the ground floor to cast the Armouns Photonicus spell.

● Go to the last screen of the ground floor and pick up the laser and summon Lady Rosmar. Give her the laser and command her to help. She will blow a hole in the wall to reveal a secret tunnel.

– Paul Shaw, Royton, Lancs.

The Price Of Magik

HERE is a list that should help you if you are having problems with The Price Of Magik. It contains some spells you need to help you complete the game.

FOCUS	SPELL
Crystal ball	ESP
Grimoire	MAD
Pendulum	DOW
Prism	XAM
Broom	FLY
Trumpet	BOM
Feldspar lens	SEE
Ashes	ZAP
Staff	HYP
Cross	DET
Candle	SPY
Axe	KIL
Wheel	DED
Box	IBM
Claw	SAN
Valerian	FIX
Focus	SPELL
Mirror	LIT/ZEN

– David McNair, Fife.

Bruce Lee

TO gain extra lives in the Bruce Lee game look for the room where there is a small round sun with a design on it that looks a bit like a face. Collect this and you will receive an extra life. Leave the room and then return and you will see that the sun has appeared again.

Keep doing this and your lives will continue going up until a maximum number is reached and no more lives can be obtained. When you reach the final screen, keep running straight to the right and the throwing stars will miss you. *– Paul Shaw, Royton, Lancs.*

Ninja

TO complete the game you have to search all six rooms of the first level before moving up a level. There are six idols to collect. If you encounter any thugs or karatekas you can kill them by continued high kicks – as they will just walk into them. Any evil ninjas can be killed by throwing three stars at them – much safer than fighting them.

Once you have all six idols, a secret door to Akuma's chamber will appear in the grey wall room. Take three stars with you and kill the four karatekas using high kicks, then throw your stars at the ninja.

Collect the idol and go back down to the Torii by the sea where you will be proclaimed the winner. *– Michael A. Hoar, Corsham, Wiltshire.*

Fight Night

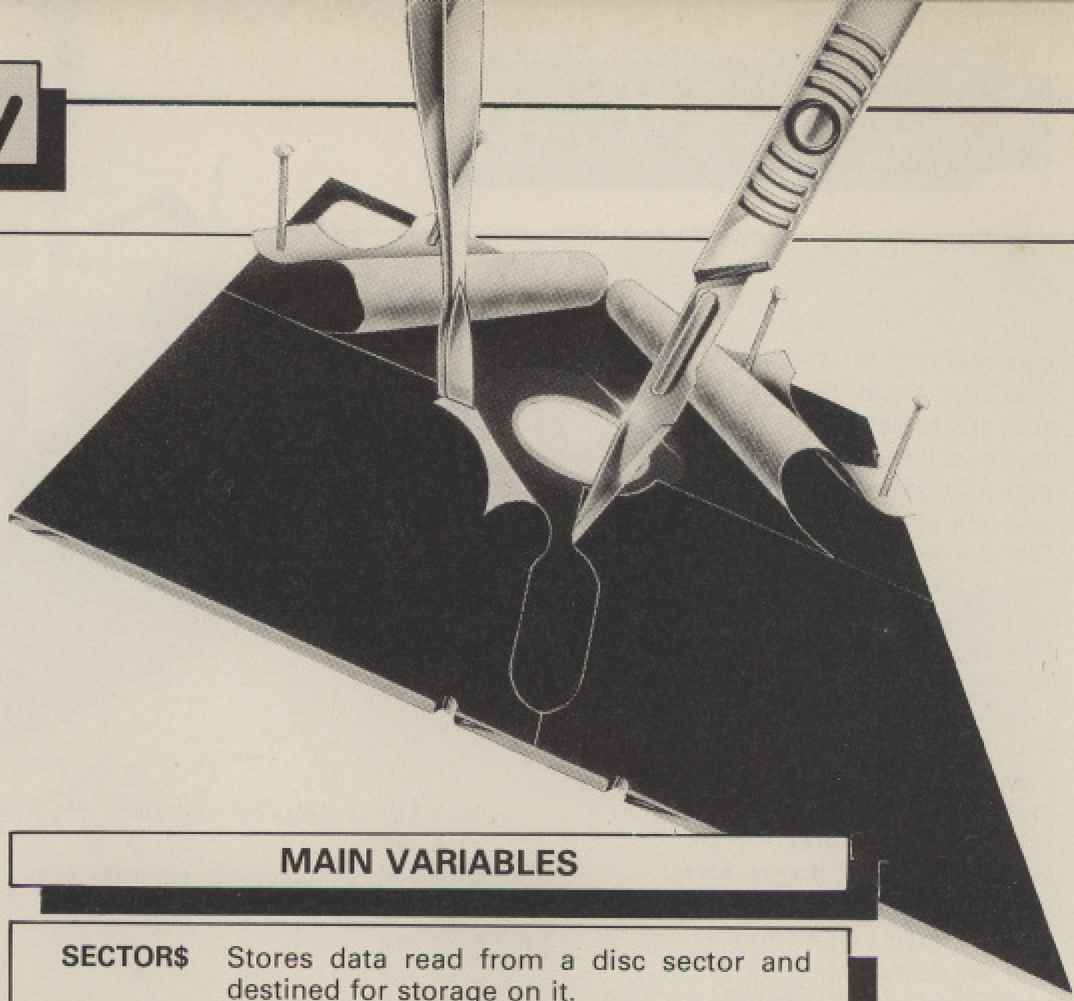
IF you press Escape and keep it pressed you will get slow motion boxing. In the main event remember to get your boxer out immediately and try to push your opponent back with a string of blows.

This is essential because when they do their characteristic blow you need enough ground to retreat or you'll be slaughtered. You can tell when they are about to use the super punches as their movement slows down. When you see this jerk your joystick back and then forwards again to recover your ground.

The only way to win is not to worry about defence. Just get in there and land a quick succession of punches to the head and body – so go out there and crack some skulls. *– Stephen Eversley, Hitchen, Hertfordshire.*

Gauntlet

WHEN you are playing Gauntlet alone select the two player option so that if one of your players is about to die simply press the button on the player two joystick and the second player will appear. If this player is about to die press the player one fire button. By alternating joysticks you can prolong the game play. *– Stephen Eversley, Hitchen, Hertfordshire.*



as there is more room for an elegant layout. As a number of Atascii codes represent actual commands to the printer, only text, numbers and certain symbols are presented in the Atascii printer dump.

The Exit option simply returns you to Basic.

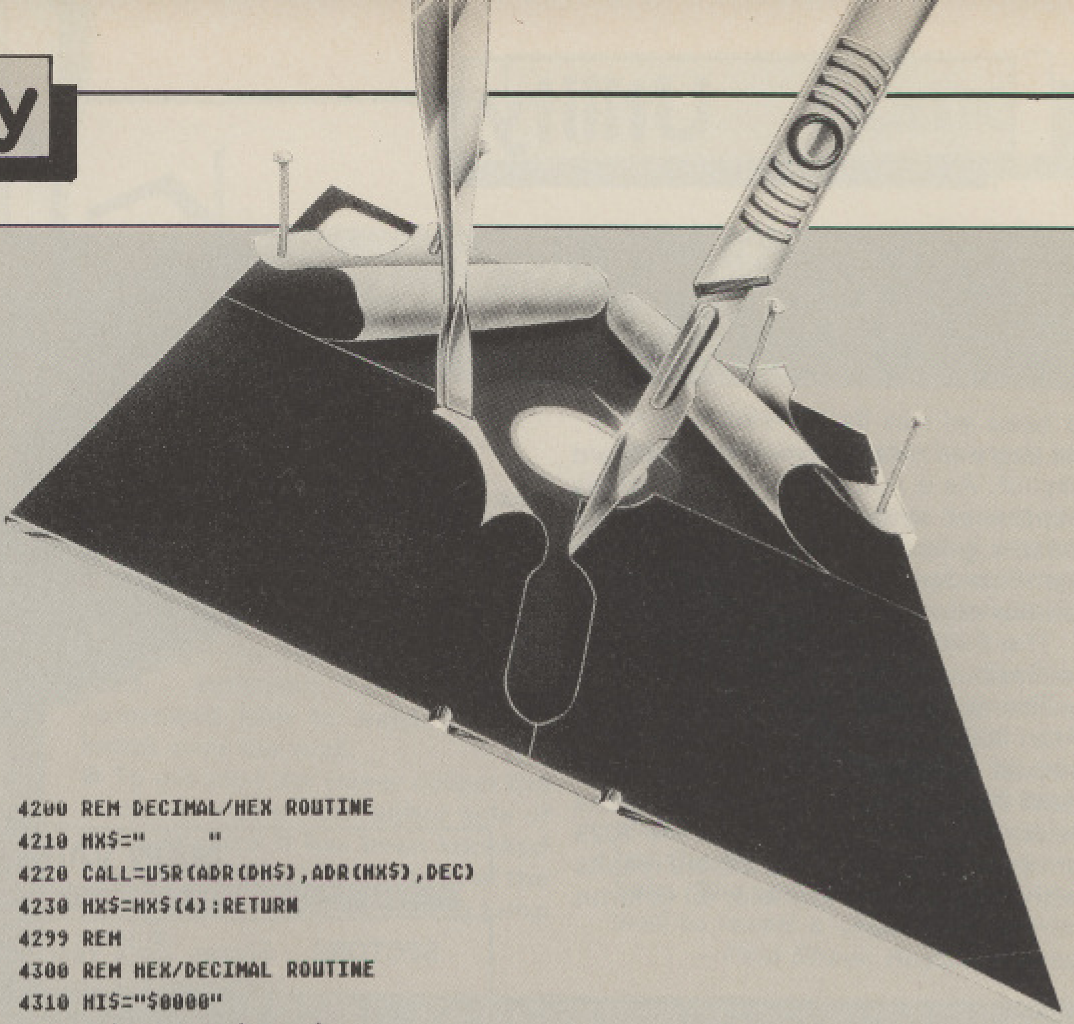
The program was written on an Atari 800XL with 1050 disc drive but it should function perfectly well on all Atari 8-bit disc systems. Similarly, the printer dump was written for the 1029 printer but should give suitable results with any Atari compatible, 60 column minimum printer.

MAIN VARIABLES

SECTOR$	Stores data read from a disc sector and destined for storage on it.
HX$	Holds the hexadecimal value of operand in decimal/hex conversions.
DEC	The decimal counterpart of HX$.
I$	A general purpose string used in configuring data and text for display.
HI$	A transient store used in configuring hexadecimal figures.
SPC$	A blank string used to erase old prompts in the menu/command screen area.
CIO$	Holds the code for the disc handling OS call.
HD$	A store for machine code for hexadecimal to decimal conversion.
DH$	A repository for code for decimal to hexadecimal conversions.
CIO	The address in ram of CIO$.
SS	The address in ram of sector store (SECTOR$).

```
0 REM ********************
1 REM *DISC SECTOR EDITOR*
3 REM *BY B.WOODLAND     *
4 REM *(C)ATARI USER     *
5 REM ********************
9 REM
20 GOSUB 1000:REM INITIALISE
40 GOSUB 2000:REM SCREEN SETUP
50 GOSUB 2200:REM GET SECT No.
60 GOSUB 2400:REM GET SECTOR
70 GOSUB 2800:REM DISPLAY SECT
80 GOTO 3000:REM PASS TO MENU CONTROL
1000 REM INITIALISATION
1010 OPEN #1,4,0,"K:"
1020 DIM HX$(5),HI$(5),I$(51)
1030 DIM SPC$(64),SECTOR$(128)
1050 DIM CIO$(4),HD$(49),DH$(43)
1060 GOSUB 4100:REM EMPTY STORE
1080 CIO=ADR(CIO$):A=0
1090 REM SETUP MC ROUTINES
1100 READ DTA:IF DTA<0 THEN 1130
1110 POKE CIO+A,DTA:A=A+1:GOTO 1100
1130 SS=ADR(SECTOR$):RETURN
1199 REM
2000 REM SCREEN LAY-OUT
2010 ? CHR$(125):POSITION 5,0
2020 ? "DISK SECTOR DISPLAY"
2030 ? "┌──┬──┬──┬──┬──┬──┬──┬──┐"
2040 ? "|08|19|2A|3B|4C|5D|6E|7F|";
2050 ? " ATASCII"
2060 ? "├──┼──┼──┼──┼──┼──┼──┼──┤";
2070 POKE 82,0:? " ────────"
2080 FOR A=0 TO 15:I=INT(A/2)+48
2090 IF A/2>INT(A/2) THEN I=I+128
2100 ? CHR$(I);":":NEXT A
2110 POKE 82,2:RETURN
2199 REM
2200 REM GET SECTOR NUMBER
2210 POSITION 28,0:? "            ";
2220 POSITION 28,0:? "Sector ";
2230 TRAP 2250:INPUT I$:DS=VAL(I$)
2240 IF DS<1 OR DS>999 THEN 2220
2250 TRAP 40000:RETURN
2399 REM
2400 REM LOAD SECTOR FROM DISC
2410 TRAP 2530
2420 POKE 769,1:REM =DRIVE NUMBER
2430 POKE 770,82:REM =READ COMMAND
2440 REM SUPPLY DISC SECTOR NO.
2450 POKE 779,INT(DS/256)
2460 POKE 778,DS-PEEK(779)*256
2470 REM GIVE RAM STORAGE ADDRESS.
2480 POKE 773,INT(SS/256)
2490 POKE 772,SS-PEEK(773)*256
2500 REM PASS CONTROL TO DISC HANDLER
2510 CALL=USR(CIO)
2520 TRAP 40000:RETURN
2530 TRAP 40000:POSITION 0,22
2540 ? "DISK ERROR!                  "
2550 FOR A=0 TO 200:NEXT A:RETURN
2799 REM
2800 REM DISPLAY SECTOR DATA
2810 POKE 766,1:FOR ROW=0 TO 15
2820 FOR COL=0 TO 7
2830 POSITION COL*3+2,ROW+4
2840 DEC=PEEK(SS+COL+ROW*8)
2850 GOSUB 4200:? "|";HX$;
2860 NEXT COL:? "|"
2870 FOR COL=0 TO 7
2880 POSITION COL+28,ROW+4
2890 ? CHR$(PEEK(SS+COL+ROW*8));
2900 NEXT COL:NEXT ROW:POSITION 2,20
2910 ? "└──┴──┴──┴──┴──┴──┴──┴──┘"
2920 POKE 766,0:RETURN
2999 REM
3000 REM ROUTE TO OPTIONS
3010 POSITION 0,22:? SPC$;
3020 POSITION 0,22
3040 ? "1 View 2 Edit 3 Write 4 Print
5 Exit";
3050 GET #1,A:? CHR$(A);:A=A-49
3060 IF  NOT A THEN 3100
3070 IF A<0 OR A>4 THEN 3000
3080 ON A GOSUB 3500,3200,3800,3120
3090 GOTO 3000
3100 GOSUB 2200:GOSUB 2400:GOSUB 2800
3110 GOTO 3000
3120 END
3200 REM SAVE SECTOR TO DISC
3210 POSITION 0,22:? SPC$;
3220 POSITION 0,22
3230 ? "Save on sector ";DS;" OK?";
3240 GET #1,A:IF A<>89 THEN RETURN
3250 POKE 769,1:REM = DRIVE NUMBER
3260 POKE 770,87:REM = DISK WRITE
3270 REM DISC SECTOR NUMBER
```

Turn to Page 50 ►



```
3280 POKE 779,INT(DS/256)
3290 POKE 778,DS-INT(DS/256)*256
3300 REM ADDRESS WHERE DATA STORED
3310 POKE 773,INT(SS/256)
3320 POKE 772,SS-INT(SS/256)*256
3330 REM PASS CONTROL TO HANDLER
3340 X=USR(CIO)
3350 RETURN
3399 REM
3500 REM EDIT RAM DATA
3510 POSITION 0,22:? SPC$;
3530 POSITION 0,22:? "Address(HEX) ";
3540 INPUT HX$:GOSUB 4300
3550 IF DEC>127 OR DEC<0 THEN 3500
3560 Y=INT(DEC/16)
3570 X=(DEC-Y*16)*3+2:Y=Y*2+4
3580 IF X>25 THEN X=X-24:Y=Y+1
3590 POSITION X,Y:INPUT I$
3600 POSITION X,Y:? "|"
3610 DDA=DEC+SS:POSITION 27+X/3,Y
3620 HX$=I$(1,2):GOSUB 4300
3630 POKE DDA,DEC:? CHR$(DEC)
3640 POSITION 0,22:? SPC$;
3660 POSITION 0,22:? "More?";
3670 GET #1,A:IF A=89 THEN 3500
3680 RETURN
3699 REM
3800 REM PRINT DISPLAYED SECTOR
3810 TRAP 4060
3820 LPRINT "Dump of sector ";DS
3830 LPRINT "  0  1  2  3  4  5  6  7
  8  9  A  B  C  D  E  F"
3840 LPRINT "_______________________________
________________________"
3850 FOR ROW=0 TO 7:I$=STR$(ROW)
3860 I$(2)="|":FOR COL=0 TO 15
3870 DEC=PEEK(SS+COL+ROW*16)
3880 GOSUB 4200:HI$=" ":HI$(2)=HX$
3890 I$(LEN(I$)+1)=HI$:NEXT COL
3900 I$(LEN(I$)+1)="|"
3910 LPRINT I$:NEXT ROW
3920 LPRINT "_______________________________
________________________"
3940 REM PRINTER TEXT DUMP
3950 FOR ROW=0 TO 7:I$=STR$(ROW)
3960 I$(2)="|":FOR COL=0 TO 15
3970 A=PEEK(SS+COL+ROW*16)
3980 IF A>128 THEN A=A-128
3990 IF A<32 OR A>122 THEN A=32
4000 HI$="  ":HI$(3)=CHR$(A)
4010 I$(LEN(I$)+1)=HI$:NEXT COL
4020 I$(LEN(I$)+1)="|":LPRINT I$
4030 NEXT ROW
4040 LPRINT "_______________________________
________________________"
4050 LPRINT :LPRINT :RETURN
4060 REM PRINTER ERROR TRAP
4070 POSITION 0,22:? SPC$;:POSITION 0,
22
4080 ? "Try turning on printer!";
4090 FOR A=0 TO 200:NEXT A:RETURN
4099 REM
4100 REM EMPTY STORE
4110 SECTOR$="♥♥♥♥":SPC$="  "
4120 FOR A=0 TO 4
4130 SECTOR$(LEN(SECTOR$)+1)=SECTOR$
4140 SPC$(LEN(SPC$)+1)=SPC$
4150 NEXT A:RETURN
4199 REM
4200 REM DECIMAL/HEX ROUTINE
4210 HX$="     "
4220 CALL=USR(ADR(DH$),ADR(HX$),DEC)
4230 HX$=HX$(4):RETURN
4299 REM
4300 REM HEX/DECIMAL ROUTINE
4310 HI$="$0000"
4320 HI$(6-LEN(HX$))=HX$
4330 DEC=USR(ADR(HD$),ADR(HI$))
4340 RETURN
4399 REM
5000 REM DISC HANDLER CALL DATA
5010 DATA 104,76,83,228
5099 REM
5100 REM HEX TO DEC. DATA
5110 DATA 104,104,133,209,104,133,208,
160,0,132,212,132,213,200,162,1,177
5120 DATA 208,56,233,48,201,10,144,3,2
33,7,24,22,212,22,212,22,212
5130 DATA 22,212,117,212,149,212,208,1
52,106,144,227,202,16,224,96
5199 REM
5200 REM DEC. TO HEX DATA
5210 DATA 104,104,133,213,104,133,212,
160,0,169,36,145,212
5220 DATA 200,152,106,104,144,5,72,106
,106,106,106,41,15
5230 DATA 24,105,48,201,58,144,2,105,6
,145,212,208,192,5
5240 DATA 208,228,96,-1
```

Get it right!

LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
0	3391	1	4999	3	4285
4	4167	5	3391	9	871
20	5279	40	5515	50	5192
60	5079	70	5573	80	6886
1000	3892	1010	2690	1020	3939
1030	4480	1050	4265	1060	5455
1080	3072	1090	4427	1100	4963
1110	5742	1130	4735	1199	871
2000	3824	2010	4511	2020	11814
2030	1948	2040	10042	2050	1966
2060	1847	2070	2696	2080	4745
2090	5128	2100	3421	2110	3318
2199	871	2200	4370	2210	4387
2220	7771	2230	5634	2240	4727
2250	3535	2399	871	2400	5083
2410	1841	2420	5750	2430	5831
2440	5296	2450	3660	2460	4477
2470	5842	2480	3711	2490	4462
2500	6622	2510	2667	2520	3535
2530	4829	2540	4183	2550	5675
2799	871	2800	4720	2810	4996
2820	2674	2830	4268	2840	4350
2850	3796	2860	3059	2870	2674
2880	4228	2890	5089	2900	6335
2910	2004	2920	3531	2999	871
3000	4263	3010	4026	3020	2551
3040	13573	3050	4510	3060	3412
3070	3925	3080	5045	3090	1852
3100	5891	3110	1852	3120	836

3200	4536	3210	4026	3220	2551
3230	6266	3240	5678	3250	5923
3260	5381	3270	4470	3280	3660
3290	4821	3300	5985	3310	3711
3320	4857	3330	5568	3340	2237
3350	1498	3399	871	3500	3130
3510	4026	3530	6721	3540	4025
3550	5229	3560	2525	3570	4231
3580	4708	3590	4239	3600	3663
3610	5813	3620	3685	3630	4626
3640	4026	3660	4869	3670	4462
3680	1498	3699	871	3800	5610
3810	1842	3820	6121	3830	7672
3840	16354	3850	4995	3860	4350
3870	4539	3880	5044	3890	4525
3900	2770	3910	3905	3920	16354
3940	4362	3950	4995	3960	4350
3970	4079	3980	3411	3990	4489
4000	3742	4010	4525	4020	4863
4030	1948	4040	16354	4050	4967
4060	4567	4070	6845	4080	7328
4090	5675	4099	871	4100	3360
4110	3463	4120	2075	4130	6036
4140	3835	4150	3148	4199	871
4200	4825	4210	1471	4220	5864
4230	3375	4299	871	4300	4795
4310	1642	4320	3485	4330	4733
4340	1498	4399	871	5000	4907
5010	3018	5099	871	5100	3910
5110	10218	5120	9196	5130	9247
5199	871	5200	3694	5210	8060
5220	7712	5230	7767	5240	2996

HOMOATARIUSER

– A BREED APART



Eric McGough carries out a brief study of a fast expanding species

HOMOATARIUSERs, due to its rather shy, retiring nature, is rarely seen outside its natural habitat. Indeed, apart from the odd trip to the newsagent to inquire, hysterically, why its *Atari User* has not been delivered, it has little need to venture forth in search of gratification.

In the main, the species spends most of its time indoors fondling the keyboard of its most treasured possession – an Atari computer. It does this whenever possible, often through into the early hours of the morning.

Rumour has it that it cannot survive for long in direct sunlight. Certainly it does not thrive in such conditions and recent surveys have proved that it is most active at night.

What can we expect if we meet one? And how will we recognise them if we do? Well, recognising them is not too difficult, but there are a number of distinct types within the species.

For instance there's the Games Player. This type is further divided into two main streams, the "shoot anything that moves" kind and the "adventurer".

The former is easily distinguished by a strange malformation of the hands. This is an evolved appendage known as a joystick.

When young this kind is further identifiable by the fact that mother is continually warning that it will ruin eyesight or at the least end up with square eye balls – this warning seems to be based on fact.

It is capable of making the most extraordinary claims, as are all homoatariusers. Such things as scoring 2,000,000 points at Drop Zone, or reaching level 96 on Fractalus. It has limited regard for strategy, preferring to live on instinct and fast reactions.

The Adventurers on the other hand are just the opposite. They worship strategy and attempt to live a life of calm, analytical problem solving.

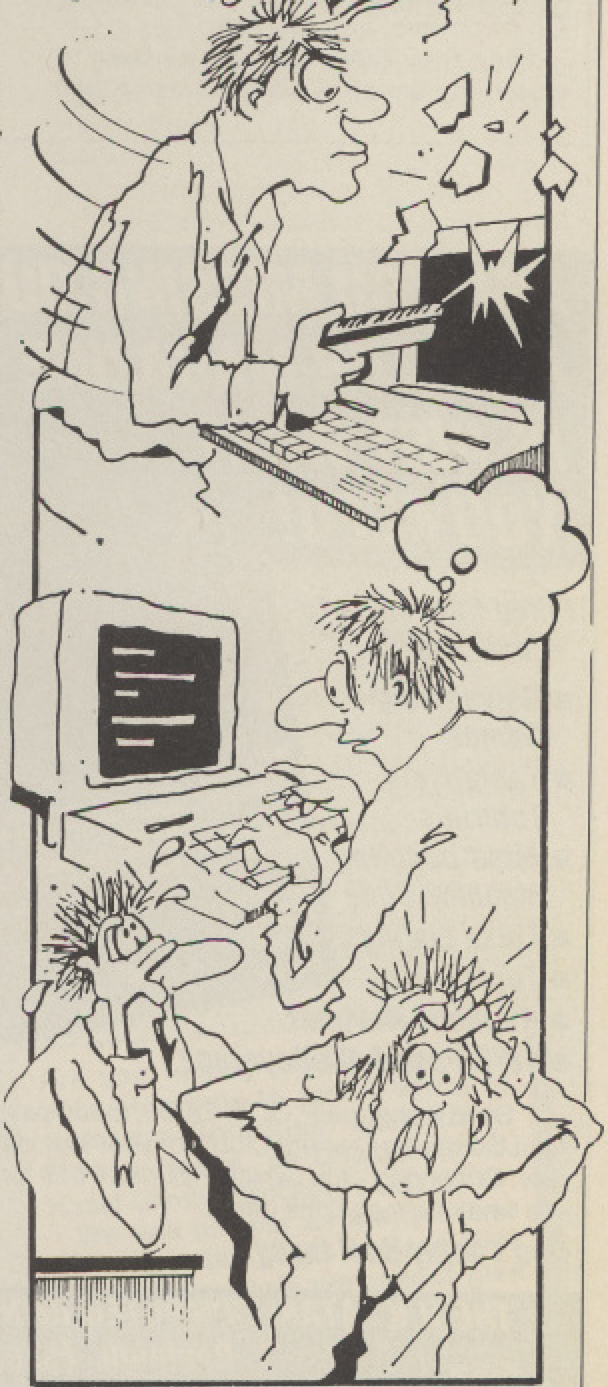
All too frequently, however, they suffer from bouts of extreme frustration, and at such times they are apt to write to *Atari User* demanding answers to their self-imposed dilemma. They use phrases like "I'm at my wit's end and about to go completely crazy. Can somebody out there tell me how to get past the man eating bear in Moron's pit of slime."

Or they may say: "I've poisoned the mad dog by offering it my cheese sarni, which I first smeared with the juice of the thorn that was growing on the ledge of the sheer rock face, which I reached by climbing down the rope that I cut from the rope bridge. And I've offered the dead dog to the angry bear but it won't eat it. It just kicks the dog to one side and kills me."

Finally they complain: "I'm sure I'm doing everything right, do you think my copy has a bug in it? Or could it be a loading problem? Also is there any truth to the rumour that there is a secret door in the chamber of the mutant hamburger, and if so where is it?"

Yet another distinct type of homoatariuser is the Programmer. Again, this can be further divided into two sorts. These are the Basic programmer and the Machine Code programmer.

If seen together you can usually expect to hear the Basic sort saying



Turn to Page 52 ▶

"I'm having trouble with my 3D animation, it's too jerky". To which the Machine Code type will say, with a smile of deep satisfaction, "You need a vertical blank interrupt". Or you might hear: "Is it possible to get 200 colours and 500 luminances on a graphics eight screen?" To which the Machine Code sort will reply: "Oh yes, no problem, but you need a vertical blank interrupt".

Both have certain traits in common. Both spend hours in a peculiar activity. They sit for long periods staring at a program listing, then, just when it seems that they have entered a state of suspended animation, they will jerk into activity with a cry of "That's it", or "Of course", or simply "Aah".

Then they claw at the keyboard for a few minutes muttering things like: "If A is less than or equal to or not less than and more than equal to or not even anything like Z, then P equals C and C equals C plus P plus Z minus A plus T. Wait a minute, how did T get in there? Oh of course, aah, that's it!"

Then they type RUN and sit back to watch the action – which doesn't take place. So they again stare at the program listing and the process restarts. This phenomena has been known to extend into days and has reduced many of the species to a state of manic depression. Yet they persist.

Programmers have been known to drink staggering amounts of coffee during a session. Statistics show that most of it is consumed cold. It is not unheard of for those unfortunates who live in the same environment to have to resort to force feeding to keep this tenacious creature alive.

There are certain do nots which it is essential to master before actively seeking out homoatariuser. Failure to observe these can result in a total breakdown of communications.

For example, never say "That thing" when referring to the computer, or "boring" when referring to the activity of fondling the keyboard. It must also be understood that when a homoatariuser uses the word paddle it is not considering a trip to the seaside. Nor is it talking about sheep when it says ram.

All in all, homoatariuser is an interesting species, deserving further study. Conversions to the species occur daily and there are reports of the evolution of a new super group. This is an elite, operating under the somewhat confusing title of 16 bit homoatariusers.

Quite what these bits are is not certain but this group does appear to have a healthy appetite as its members talk continuously of megabytes.



SOFTWARE Solutions

Your programming problems solved by ANDRE WILLEY

Getting a start

I HAVE just bought one of the bargain price 800XL computers after having owned a Dragon 32 for years. Overall I'm really impressed – especially by the games – but I'm having a couple of problems with the string handling facilities.

I'd like to write a small program to store names and telephone numbers, but I can't seem to get the string array system to work. I have dimensioned NAME$ *and* PHONE$ *for 50 elements each, but when I try to access part of one of them – such as* NAME$(5) *– I seem to get various different portions of element one.*

Also, does the Atari have anything like the MID$, LEFT$ and RIGHT$ commands on other computers? All I seem to be able to find is the LEN command.

I hope that you will be able to help as I can't even start my program until I work it out. – **J. Grant, Llanfairfach, S. Wales.**

● Atari Basic doesn't support string arrays in the way that you are used to. First, the DIM statement when applied to a string specifies the maximum length of a single string, not the number of elements to be used for a string array. Thus DIM NAME$(50) allows for up to 50 characters within the string *NAME$*, not 50 seperate strings. The maximum length allowed for one string is 32k, or 32768 bytes.

Although there are no string arrays as such, you may split up a single string into many smaller portions known as substrings.

PRINT NAME$(1,9) would print out the first to the ninth characters of NAME$ in just the same manner as LEFT$(NAME$,10) would have done on the Dragon.

PRINT NAME$(10,20) would print out the portion of NAME$ starting at the tenth character and finishing at the twentieth (in a similar way to MID$ on the Dragon).

PRINT NAME$(30) would print the rest of NAME$ starting with the 30th character. By combining this with the LEN function you can obtain the equivalent of the RIGHT$ command. So NAME$(LEN(NAME$)-19) would return the final 20 characters of the string.

With all of this at your disposal it is relatively simple to emulate a string array by splitting a long string into a set of substrings. For example, characters 1 to 40 could be your first element, 41 to 80 the second element and so on. Don't forget to DIM the string beforehand, and fill it up with blanks. For an array of E elements, each of up to MAX characacters, you would use:

```
10 FINAL=E*MAX
20 DIM NAME$(FINAL): NAME$(1)=" ":
 NAME$(FINAL)=" ": NAME$(2)=NAME$
```

This is a quick way to initialise a string to spaces and element E can now easily be accessed with NAME$(1+MAX*(E-1),MAX*E). As an example, the following program will input 10 strings and then print them back out again in reverse order.

```
10 DIM NAME$(10*40),TEMP$(40)
20 NAME$(1)=" ": NAME$(10*40)=" ": NAM
E$(2)=NAME$: REM FILL WITH SPACES
30 FOR E=1 TO 10
40 PRINT "ENTER STRING ";: INPUT TEMP$
50 NAME$(1+40*(E-1),40*E)=TEMP$
60 NEXT I
70 FOR E=10 TO 1 STEP -1
80 PRINT "STRING ";E;" = ";
90 PRINT NAME$(1+40*(E-1),40*E)
100 NEXT I
110 END
```

It may look a little complicated to start with, but once you've got the hang of it you can forget the way the string system works and just use the formulae in the same manner as you would a normal string array.

Names on call

I AM a self-employed salesman and have to refer to old clients constantly. I have just bought an Atari 800XL complete with 1050 disc drive and cassette recorder. Could you tell me if there is a program available to enable me to list and call up names, addresses and accounts of customers on file.

Also, can I buy a disc program to convert prerecorded cassette games to disc, as we all know that by the time the cassette has loaded you've forgotten what the games was. – **Mr J. Sayers, Warden Bay, Kent.**

● There are a number of ways to store the information you require. You could always use a full accounts package, but probably more useful for the purposes you outline would be a good database program.

The database module from Mini Office II would probably suit your needs and also give you other useful features for your business – word processing, mail merging and so on.

There are a number of more powerful but more expensive databases available and the best is probably SynFile+, from Synapse Software. Although this is an American product it can be easily obtained from Atari software importers such as Software Express.

Your second question is less easy to answer. Firstly, to copy a tape on to disc is not strictly legal, even if you own the original. Also, most commercial tapes use various systems to prevent copying of any type including transferring to disc.

You would do far better by buying your software on disc rather than tape in the first place, or contact the companies concerned for a disc version if you already have the tape.

There are many so-called backup programs advertised, but these aren't able to copy most of the protected titles available – besides breaking the copyright laws.

Are you having problems getting your programs to work? Write to Software Solutions, Atari User, Europa House, 68 Chester Road, Hazel Grove, Stockport SK7 5NY.

We will answer as many as we can within the pages of *Atari User* but, unfortunately we cannot give personal replies.

MicroLink
in association with
TELECOM GOLD

NEWSLETTER

Take off with MicroLink

THE British Airline Pilots Association – BALPA – has marked its golden jubilee by joining MicroLink.

Trade union for 6,000 commercial pilots, BALPA negotiates with 30 UK airlines and a similar number of foreign flag carriers who employ its members.

"We celebrate our 50th birthday this year, so it seemed an appropriate time for us to log on to the new information technology", said a spokeswoman. "Until now we've depended on the telephone – our office didn't even have telex.

"A very high proportion of our members are computer and communications enthusiasts when they're not flying. They'll be happy now MicroLink has provided facilities for two-way electronic messaging between themselves and BALPA.

"Apart from improving contact with our members, we'll be able to use electronic mail and telex to communicate with airlines and other pilot associations throughout the world".

Legal advice goes online

MICROLINK has scored yet another world first by taking on board a unique electronic legal and financial service for firms and individuals.

Insight provides round-the-clock legal advice, help with tax and VAT problems, and insurance cover against the cost of litigation.

It serves a wide range of personal and business needs resulting from minor problems like disputes with neighbours up to full scale Customs & Excise investigations.

A team of 50 solicitors and barristers provides a 24-hour legal advisory service. Any legal problem can be dealt with either by electronic mail or telephone. Full written advice on complicated matters is promised within 24 hours.

There is a legal fees insurance package covering solicitors' and barristers' fees, court costs, witness expenses, and opponents costs in certain cases.

Personal financial advice – on banking, pensions, insurance and tax – is offered during office hours and available in most cases through a local number. Written reports can be provided within 24 hours and consultants are available for personal visits.

Business membership of Insight also includes a wide range of special assistance for companies, covering such areas as staff insurance, tax, cash flow forecasting, pension scheme analysis and employee benefits.

Companies can also buy an Inland Revenue and VAT protection service, in the event of in-depth tax, PAYE or VAT investigation.

Company accountants can draw on advice from former Inland Revenue and Customs & Excise inspectors and get professional representation at hearings and tribunals. Up to £25,000 towards professional fees for preparing a case is included in the protection.

Two brand new Insight services will benefit from the immediacy of MicroLink communications. The first provides on-line mortgage quotations and information for property buyers.

The other supplies details about commercial finance, venture capital and other forms of commercial funding for established businesses and start up schemes alike.

Insight, operated by Investment Marketing Services, is an electronic mail extension of the IRPC legal and tax advisory service which has been operating for seven years and has half a million UK subscribers.

Calling all subscribers

THE latest technological advance on MicroLink allows subscribers to enjoy all the communications benefits of radiopaging for as little as 36p a day.

Thanks to a link-up with British Telecom's national radiopaging service, it means that MicroLink electronic mail and telex transmissions need no longer stay unnoticed on reaching their destination. And users won't be put to the trouble of accessing their mailbox when it's empty.

As soon as an Email or telex message arrives the radiopaging service is automatically alerted and the subscriber gets a "bleeper" call.

The same procedure takes place in the opposite direction – messages to other people can't be ignored or overlooked if the addressee carries a radiopaging device.

There are also all the other advantages of radiopaging – like keeping users constantly in touch with their base.

CONSORTIUM FOR COMMS

A UNIQUE association of community groups involved in computing has gone on-line with MicroLink.

Hackney Info Tech Consortium is a non-profit company formed by 45 adult education institutes, training schemes and local voluntary organisations in the London borough.

It supports member organisations – including the City of London Polytechnic – that use computers for administration, maintaining databases, and courses in programming, business computing, design and desktop publishing.

Consortium executive director David Cheetham said:"MicroLink will help our assessment of socially useful applications of new technology – particularly the potential for development of a local online community database.

"We envisage starting with a directory of education, training and leisure information then gradually allowing local organisations, co-operatives and trades unions to set up closed user groups".

YOUR chance to join MicroLink – turn to Page 6

Error reports are not always correct

I HAVE just spent several hours typing in the program Bounder from the June 1987 issue of Atari User and was very disappointed when an error appeared at line 186.

I checked and rechecked this line and found no error in my typing, so I am writing in desperation to ask if there is a misprint in the magazine.

Also in the Moneybags program from the same issue I found an error in the listing. The GIR checks out perfectly and so I was very surprised when I got an error on line 1820.

When I checked this line I discovered that the line reads:

```
IF...THEN 1850
```

This confused me as there is no line 1850. So I took the next logical step and changed it to read:

```
IF...THEN 1860
```

To my pleasure I found that this cured my problem. – **Wayne Page, Kent.**

● There are no misprints in the listing for Bounder, so it appears that you have made a typing error. Remember that even though the error message states line 1860 the fault may be somewhere else in the program listing.

Once you have checked that line again and made sure that you have typed the control characters in the print statement correctly check that the variables in the line are receiving the correct values from the program as it executes.

The variables to check are N4, YB, N, and N8 as any of these could be passing the wrong value and thus cause the error. So look at references to these in other lines.

Your second point concerning Moneybags in the same issue is correct. Unfortunately line 1850 was missed out, but as it was only a REM statement it does not affect the running of the program providing you make the change you mention.

Printing at last

I OWN an Atari 130XE and disc drive and an Atari 1029 graphics printer. In the July 1987 issue of Atari User I was pleased to see the dump 15 printer utility for my printer.

It caused great jubilation because for a long time I have found that all the printer utilities on the market ignore my trusty printer. Now I will be able to produce some wonderful prints thanks to the superb program you printed.

I would also like to say that Mini Office II is a splendid piece of software. Since buying it I have hardly left it alone and coupled with the fact that it fully supports my 1029 printer and only costs £19.99 it is a superb bargain. – **Keith Pattison, Yorkshire.**

Easier listings

MY friends and I all use the Get it Right! when we type in your listings and find that we have no problems.

Admittedly a novice may have a little problem at first, but with practice he will soon use it expertly.

So thank you for a great utility that has made my task of typing in your listings a lot easier. – **Richard Black, Glasgow.**

A pit problem

IN the May 1987 issue of Atari User there were some tips from Neil Richardson for Spellbound by Mastertronics. I found that some of his instructions were not quite right.

The correct procedure is to go to to the secret tunnel entrance on the ground floor, summon Lady Rosmar and then command her to help. She will then blow the doorway of the secret tunnel open but unfortunately I have not figured how to get past the pit on the ground floor. So if any readers know how to get past this could they please help? – **Paul Webley, Gosport.**

What a bounce

I HAVE just typed in the game Bounder from the June 1987 issue of Atari User and found to my horror that when the little man bounces up and down the screen he leaves a trail of himself behind him.

My computer is an old 800 and I use an 810 disc drive. Is there an error in the listing or does the error lie within my equipment? – **A.T. Allen, Essex.**

● Unfortunately the program is written for XL/XE computers, and due to certain differences in the computers operating systems the program will not run correctly on old ones with the revision A operating system.

ERROR LOADING PROBLEM SOLVED

I READ the mailbag section of Atari User every month and find it very interesting. But I found an error in the reply to Mr. Evan Proudfoot in the June 1987 issue about his cassette loading problems.

Error 21 indicates that he is attempting to CLOAD a file that has been saved under the LIST"C:" or SAVE"C:" command. So if Evan tries to ENTER"C:" or RUN"C:" the program he saved he may with luck get his file back.

Also I was wondering if it is possible to use the international character set on the XL/XE within the Mini Office II word processor as I find this would be very useful in my business. – **Rob Anthony, Surrey.**

● It is possible to use the international character set from Mini Office II.

Look in your printer manual for the appropriate printer codes for the set you require and then go to the printer set up menu on Mini Office II and enter the code string.

For example, on an Epson compatible printer 27, 82, 3 selects the English character set.

Synthesiser components

IN the July 1987 issue of Atari User you published an article showing how to make a speech synthesiser. I decided to build this particular gadget and set about ordering the components

Turn to Page 56 ►

ATARI USER Mailbag

WE welcome letters from readers – about your experiences using the Atari micros, about tips you would like to pass on to other users . . . and about what you would like to see in future issues.

The address to write to is:

Mailbag Editor
Atari User
Europa House
68 Chester Road
Hazel Grove
Stockport SK7 5NY

from Maplin Electronics Supplies.

I noticed that two of the components are not listed on the parts required table. I know a little about electronics and figured out that the item BR1 is a bridge rectifier but which one to order is still a mystery.

The second component is X1, which is a crystal of some description. Could you please print the components codes and the Maplin order codes. – **Grahme Harding, Cleveland.**

● You are correct in your choice of component. BR1 is a Bridge Rectifier: Its component code is W005, its Maplin order code is QL37S and it costs 25p. The component X1 is a 3.2 MHz crystal: Order number FY86T costing £1.40.

Pictures appreciated

THANKS for the introduction of the Palette page in Atari User. *It shows critics of Atari computers just what these micros can do.*

The pictures highlight the availability of a multitude of colours and the superb resolution of the Atari machines. I especially liked the Bonzo the dog picture in the June 1987 issue. – **Andrew Llewellyn, Ebbw Vale, Gwent.**

No Snoopy

COULD you tell me if Snoopy and the Red Baron, originally written for the 2600 game console, is available for the XL/XE range of computers. Could you also tell me if the game Shao-Lin Road is available for the XL/XEs. – **Bernard Hatton, Liverpool.**

● The answer to both of your questions is very simply no. Although many titles for the 2600 and the early VCS have been converted for the XL/XE computers unfortunately the games you mentioned haven't.

Why the error?

I TYPED in the listing for Dump 15 from the July 1987 issue of Atari User and when I ran the program I got an error at line 125. Could you please explain to me the problem as my listing according to your Get it Right! is correct. Is there an error in the listing? – **R.J. Chandler, Manningtree, Essex.**

● The listing of Dump 15 is correct and you will find that line 125 is looking at the keyboard for you to enter F$. This variable holds the name of the file you are loading and it must be entered in the form:

D:filename.extender.

Filename can be up to eight characters long and the extender up to three. They must both be in capital letters and if the name is not entered in this form then an error will occur at line 125.

Wider spreadsheets

I RECENTLY bought Mini Office II and I am amazed at its capabilities.

It is possible to create a spreadsheet with more than 40 characters in width so I am wondering if the Atari 1029 printer, which is fully compatible with this program, will accommodate 80 character printouts.

If it doesn't will I have to buy an Epson compatible printer to do so. – **M. Fairburn, Hambleton, North Yorks.**

● The Atari 1029 is fully compatible with Mini Office II in all ways and so it will print out the spreadsheet 80 characters wide.

If the width of the spreadsheet exceeds this, Mini Office II splits it into parts so that the printer can still handle it.

Printer software

I WANT to buy a dot matrix printer and I'm quite swayed towards the Star NL-10.

I want to be able to produce a newsletter which includes graphics, patterned borders and various text styles and sizes. Is my Atari 8 bit computer capable of this?

Also, I have looked at the bewildering array of printer software available and I am totally confused.

I have a touch tablet and AtariArtist software, and was wondering if there is any way I could utilise it to create pictures to dump to the printer. – **D Murr, Rainham, Kent.**

● Let's start with software. Print Shop from Broderbund Software will allow you to create a multitude of different borders and gives a large choice of text and text sizes.

Unfortunately it will not dump AtariArtist pictures, but you have the option to create certain graphics within Print Shop using the touch tablet or joystick.

These can then be printed in various sizes and in various positions on the paper.

If you use this package you should find your 8 bit

IN SEARCH OF A CHARACTER

IN the Get it Right! listing in the August 1986 issue of Atari User *I am having problems finding two of the characters – an upward pointing arrow curling to the left on a black background and a similar arrow without the black background.*

Could you please tell me how to get these characters and what do they do within the program? – **A Shortell, Cheshire.**

● The first character is obtained by pressing Inverse Video which is at the bottom right button of the keyboard, then press Escape and finally the Control and 2 together. The second is obtained by pressing Escape followed by Control and Clear together. When you run the program the first character will make a beep sound when the character is encountered.

The second character is the clear screen character and when you run the program it simply clears the screen.

computer will easily handle the tasks you want.

Print Shop can be obtained from several suppliers advertised in *Atari User*.

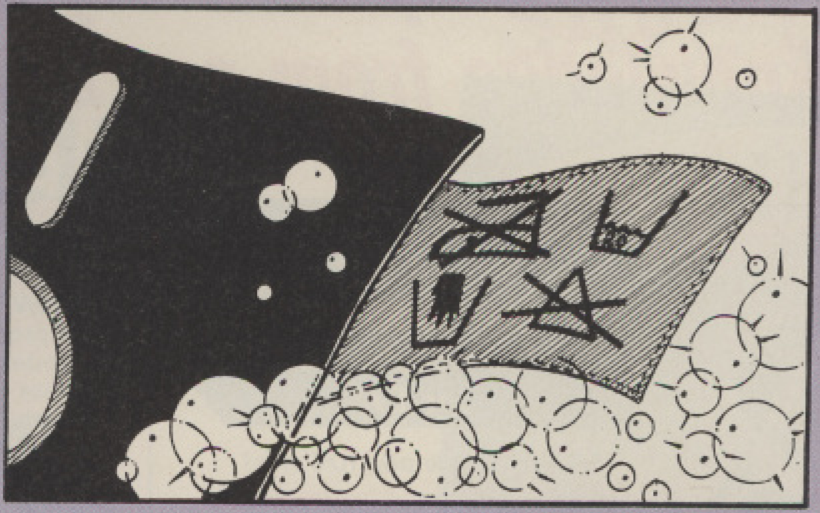
Your other question is slightly more difficult to answer, due to the number of available printers and the quality of them.

The Star NL–10 that you suggest is capable of what you want as are all Epson compatible printers. But remember that you will also need an interface box and cable.

Print Shop can be configured to a number of printers and so the choice is up to you depending on what price range you are looking at.

Right in the mark

I WOULD like to say how much I enjoy the reviews section of Atari User. *I always read the comments of reviewers before buying a game as they are always very well put and the marks given at the end usually describe the actual game very well.* – **Lee Goodchild, Northern Ireland.**



WHITER THAN WHITE

I HAVE always been told once a disc has a fingerprint on it that it becomes unusable and should be destroyed.

I found this to be untrue last week when my young son got hold of one of my discs and put fingerprints right across the visible disc area.

I found that I could not retrieve any information, so I got a cotton bud, dampened it with fresh cold water and washed the disc surface. After leaving it for three minutes the disc was dry, the marks were gone and when I loaded the disc I found that I could retrieve all data.

I was quite pleased with my experiment. So I am now very interested in any comments you may have. – **Tony Robson, Oakham, Leicester.**

● The only comments we can make are don't tumble dry, don't boil wash and don't iron it!

Also, it's a good idea to try experiments like this on backup discs and remember that, even if discs still work, dirt on them can affect the heads in the disc drive.

Right on line

ATARI 1029 printer owners who typed in Kevin Milford's shaded printer dump from the July issue of Atari User *may have noticed that it doesn't set the printer to nine lines per inch, resulting in a slight gap between each printed line.*

To fix this just change line 2110 to:

```
2110 PRINT#2;CHR$(27);
CHR$(57);CHR$(27);
CHR$(65);CHR$(1);CHR$(225);
:RETURN
```

In Andre Willey's look at Dos in the same issue the sectors on the disc are not arranged quite as shown in Figure I.

The correct order is 1, 3, 5, 7, 9, 11, 13, 15, 17, 2, 4, 6, 8 and so on. This is, I would imagine, designed to minimise the rotational latency.

However, since the physical order of the sectors on the track is transparent to the user, this is of little importance.

Finally, I hope that Atari has had the sense to connect the new XSD551 drive through the parallel port.

While this would alienate 400/800 users and would be more complicated to implement than a serial drive, it would allow the drive to be far faster than any currently available, even with all the various high speed enhancements.

Whether they will do this I don't know. Atari seems to be taking the easy way out, for example with the awful joystick port method of connecting the XEP-80, so I am not too optimistic. – **A.W.R. Crawford, Penicuik.**

● The disc sectors are numbered as you say, but to illustrate the article and save confusion we numbered them consecutively in the diagram.

You are correct in your assumption that the numbers are spaced out so that after reading and processing, for example, sector 1 the disc head will be in the position to read sector 2.

It appears that the new Atari drive will be serial. A drive is available that connects to the parallel port but it is not for floppy discs.

The Supra Drive is a 20Mb hard disc and has very fast access times.

Missing listing

I USUALLY find the fiveliner programs intriguing, fascinating and very interesting. Keep it up. What about publishing some tenliners?

I am having problems with the fiveliner Space Invaders in the June issue of Atari User. *Can you tell me what characters are within the quotes on lines 10 and 30. I inserted characters and the game works well but I would be interested to find out what Richard Parkes originally intended.* – **D W Parsons, Istead Rise, Northfleet.**

● We're interested in listings of any length. A tenliner with a full explanation would make a small feature in itself so, although they don't have a special section, we would love to publish some.

If any of our readers have any interesting programs send them in to Atari User, Europa House, 68 Chester Road, Hazel Grove, Stockport, SK7 5NY.

Unfortunately some characters did not show in the listing of Space Invaders. The correct lines are:

```
10 POSITION X,J:? "***";:FO
R U=0 TO 100*Z:NEXT U:SOUND
 0,0,0,0:? "◀◀◀":X=INT(9+20
*A):Y=1:ON Z GOTO 20:GRAPHI
CS 0:POKE 752,1:G=20:S=0.2
30 POSITION G,23:? " ▄┻▄ ";
:POSITION I,J:? "   ";:POSI
TION X,Y:? "▟▙";:I=X:J=Y:D
=STRIG(0):P=124:C=0.5:POSIT
ION 15,0:? "SCORE ";SC
```

The characters inside the quotes on line 10 are the ones with Atascii codes 254, 254, 254. In the three sets of quotes on line 30 the codes for the characters in the first quotes are 32, 9, 24, 15, 32, in the second set 32, 32, 32 and in the final set 17, 162, 5.

ATARI USER MAIL ORDER OFFERS

While stocks last!

Build up a library of fun and knowledge from our back issues!

May-November 1985

CONTENTS INCLUDE: A profile of Atari's boss Jack Tramiel; an introduction to the 6502 microprocessor; Basic for [illegible]; 12 page feature on communicating with your Atari; [illegible] list [illegible]. Plus lots of [illegible] Squash Frog Jump, Bo[illegible] Graffiti Gobbler, Maze [illegible] Pontoon, Guy [illegible] *ALSO:* – Ge[illegible] to grips with sound and [illegible] assembler and disassembler; 68000 addressing modes and operating environment; list processing with Logo; [illegible] Disc utility; Adventure hints and tips; Hex/Ascii dump utility and – much much more.

SOLD OUT

7 complete issues for £4.90*

10 complete issues for £7*

**Prices include p&p (UK only)*

Need a binder for your magazines? We'll send one for only **£4.95**

March – December 1986

CONTENTS INCLUDE: – Speed up Basic programs with our compiler; disc index utility; player missile graphics series; five exciting hardware projeects for you to tackle; fix the bugs in Revision B Basic; link your Atari to databases in the USA; edit files and memory with our data editor; plus hints and tips from our adventure expert.

LOTS OF GAMES – Horse Play, Cavern Escape, Mancuna, Space Maze, Frank the Fruit Fiend, Fence Builder, Cubes in Space.

TO ORDER PLEASE USE THE FORM ON PAGE 61

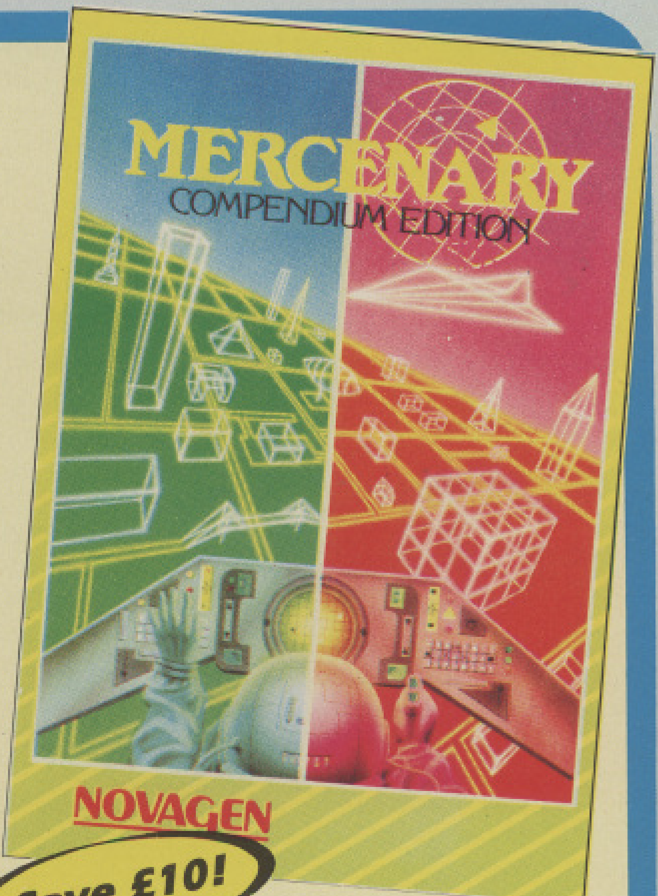
Now – the COMPLETE Mercenary Compendium

Here's all you need to get the last ounce of fun and excitement out of one of the most talked-about games of 1986. This is what this package contains:

Escape from Targ. A unique combination of flight simulation, adventure and arcade action, PLUS high speed 3D vector graphics! You crash-land on planet Targ's Central City and you have but one aim – to escape!

Targ Survival Kit. For help when you need it most. Includes maps of Central City and its subterranean complexes. And a novelette, "Interlude on Targ", with more hints and tips.

The Second City. Thought you'd got away? Then load in this extra data set and think again! No hints or clues this time – you're on your own!



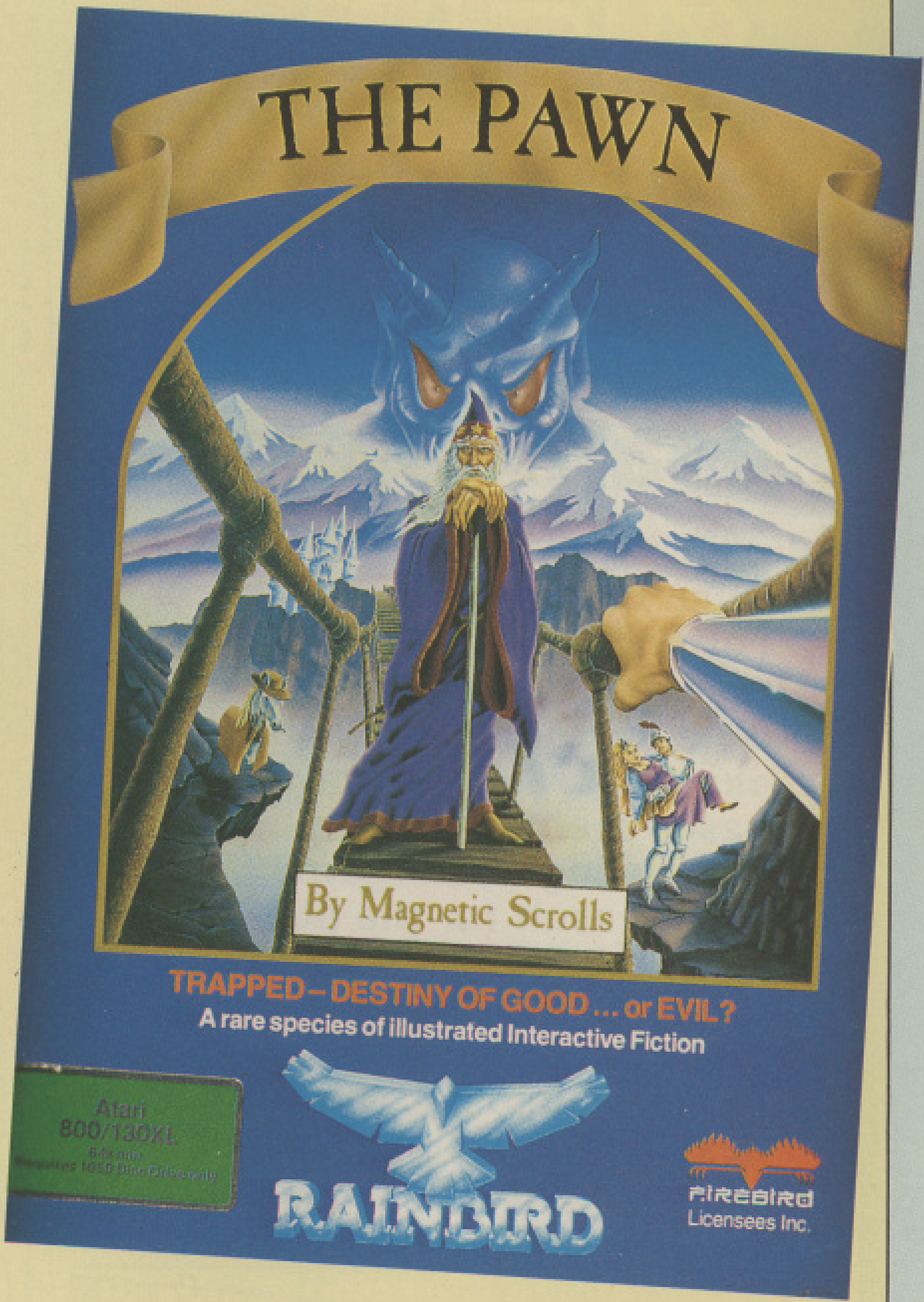
Save £10!

Suitable for	Product	Format	RRP	Special reader offer	YOU SAVE	Offer including subscription	YOU SAVE
Atari XE/XL*	Mercenary Compendium	Tape	£14.95	£12.95	£2	£17.95	£9
Atari XE/XL*	Mercenary Compendium	Disc	£17.95	£14.95	£3	£19.95	£10

ATARI USER MAIL ORDER OFFERS

Lose yourself in the magical world of Kerovnia!

SAVE UP TO £10



This fascinating adventure features the most sophisticated parser around: You can type complex sentences and interact with the many characters, including some very intelligent animals.

This superb package includes a 44-page novel and a cryptic help section.

"The program took three man years of programming time to produce – and it shows. The Pawn is the stuff from which cults are made."

– Anthony Ginn, writing about the Atari ST version in the May 1986 issue of the Atari User



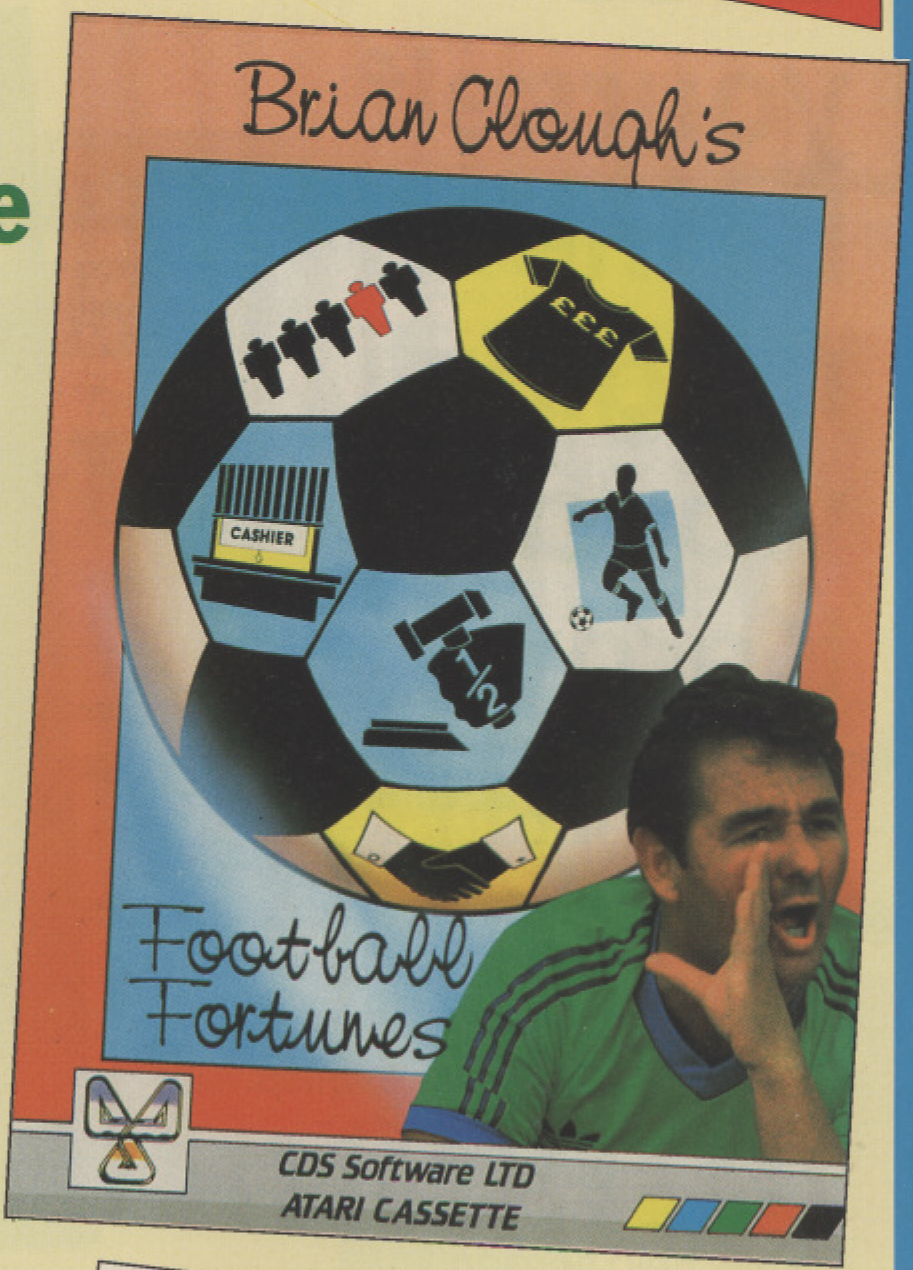
Suitable for	RRP	Special reader offer	YOU SAVE	Offer including subscription	YOU SAVE
Atari 800/130 with minimum 64K plus 1050 double density disc drive	£19.95	£14.95	£5	£21.95	£10

TO ORDER PLEASE USE THE FORM ON PAGE 61

ATARI USER MAIL ORDER OFFERS

SAVE UP TO £7

Play football's first interactive computer and board game



Brian Clough's Football Fortunes is a football management game with a difference – it combines an excellent range of computer-based features with a fascinating board game.

The result for the players is a package which is as much fun and as skillful to play as other best-selling board games, combined with the flexibility and speed of play which only a computer can supply.

CONTENTS INCLUDE

- Atari software
- Playing board
- Five coloured counters
- 112 Player cards
- 10 spare Player cards
- Six immunity cards
- Pack of money

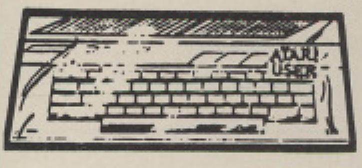
FEATURES

- Two to five players
- Four skill levels
- Variable game length
- Computer die
- Teleprinter
- Constantly updated league tables
- Assessments of each manager's performance

Suitable for	Product	Format	RRP	Special reader offer	YOU SAVE	Offer including subscription	YOU SAVE
Any Atari with 48k	Brian Clough's Football Fortunes	Tape	£14.95	£11.95	£3	£19.95	£7
		Disc	£17.95	£14.95	£3	£22.95	£7

TO ORDER PLEASE USE THE FORM ON PAGE 61

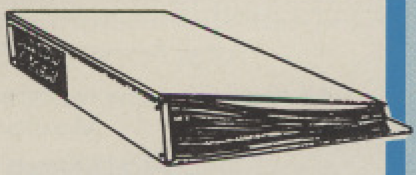
Protect your Atari . . .



with this luxury dust cover for your Atari XE or XL. It's made of clear, water-resistant vinyl and bound with strong cotton

Only £3.95

. . . and your Atari Users



A year's supply of Atari User can be kept in this handsome chocolate brown binder

Only £4.95

ATARI USER ORDER FORM

Valid to August 31, 1987

All prices include postage, packing and VAT

Overseas orders despatched by Airmail.

Annual subscription

New

		Code	(✓)	£ p
UK	£12	7001		
Europe (incl. Eire)	£15	7003		
Overseas (Airmail)	£30	7004		

Commence with ________ issue

Renewal

		Code	(✓)	£ p
UK	£12	7002		
Europe (incl. Eire)	£15	7701		
Overseas (Airmail)	£30	7702		

Back Issues

£1.25 UK
£1.75 Europe & Eire
£3.25 Overseas

1987	Code
Jan	7409
Feb	7410
Mar	7411
Apr	7412
May	7413
June	7414
July	7415

Back Issue Magazine Bundle

March 86 – Dec 86 (10 complete issues) 7051
£7.00 U.K.; £8.00 Europe; £16.00 OverseasAirmail

Disc Storage Box

NEW

Holds up to 60 5.25" Discs £4.95 7098

Dust Cover

£3.95 UK
£4.95 Europe/Overseas

130XE	7031
800XL	7060

Atari User Binder

£4.95 UK; £6.95 Europe; £11.95 Overseas Airmail 7029

The Pawn

		With sub *	Without sub	Code
Atari 800/130	Disc	£9.95	£14.95	7033/7034

* Only if accompanied by a subscription order or renewal
Add £2 for Europe/£4 for Overseas

Jewels of Darkness/Silicon Dreams

		With sub *	Without sub	Code
Jewels of Darkness	Disc	£8.95	£11.95	7035/7036
Jewels of Darkness	Tape	£8.95	£11.95	7037/7038
Silicon Dreams	Disc	£8.95	£11.95	7039/7040
Silicon Dreams	Tape	£8.95	£11.95	7041/7042
Both	Disc	£15.90	£21.90	7043/7044
Both	Tape	£15.90	£21.90	7045/7046

* Only if accompanied by a subscription order or renewal
One product: Add £3 for Europe £5 for Overseas
Both: Add £6 for Europe £10 for overseas)

Superscript

NEW

Atari XL/XE Disc £29.95 7097
Add £2 for Europe/£5 for Overseas

Brian Clough's Football Fortunes

NEW

		With sub *	Without sub	Code
48k Required	Tape	£7.95	£11.95	7093/7094
	Disc	£10.95	£14.95	7095/7096

* Only if accompanied by a subscription order or renewal
Add £2 for Europe/£5 for Overseas

Mini Office II

Disc 400/800/XL/XE £19.95 7050
(48k required)
Add £2 for Europe/£5 for Overseas

Mercenary Compendium

		With sub *	Without sub	Code
Atari XL/XE	Tape	£5.95	£12.95	7083/7084
	Disc	£7.95	£14.95	7085/7086

* Only if accompanied by a subscription order or renewal
Add £2 for Europe/£4 for Overseas

Readers in Europe (inc Eire) add £2. Overseas add £4 per item unless otherwise indicated

TOTAL

Send to: *Database Publications*, FREEPOST, Europa House, 68 Chester Road, Hazel Grove, Stockport SK7 5NY.

(No stamp needed if posted in UK) *Please allow 28 days for delivery*

Order at any time of the day or night

Telephone Orders:	*Orders by Prestel:*	*MicroLink/Telecom Gold*
061-429 7931	Key *89, then 614568383	72:MAG001

Don't forget to give your name, address and credit card number

ENQUIRIES ONLY: 061-480 0171 9am-5pm

Payment: please indicate method (✓)

Access/Mastercard/Eurocard/Barclaycard/Visa Expiry Date ___ / ___

No. ____ ____ ____ ____

Cheque/Eurocheque made payable to Database Publications Ltd.

Name ________ Signed ________

Address ________

________ Post Code ________

Tel ________

AT8

ATARI 400/600/800/XL/XE UTILITIES AND GAMES

HOWFEN DOS 3 – The best menu driven file/game management system yet. Holds up to 40 programs per disc displayed on a colourful menu. Run the program you want at the press of a button. 8 Functions including multi stage tape to disc, disc to tape, disc to disc. Extra function to convert all your old menu systems (multi boot etc.) to Howfen DOS works in any density – (at warp speed in DD). No other program needed. £17.95.

DISC DUPE 3 – Excellent sector copier for ordinary or bad sectored discs. Remembers bad sectors and recreates them. £13.95.

KOPY KART – Transfer your favourite cartridge software to disc or tape. Comes complete with cartridge emulator (please state tape or disc). £20.95.

KOPY T4 – Back up single/multi stage tapes easily. £7.95.

AUTOMENU – Automatically lists every file on disc (Basic or Binary) and will run them at the press of a button. Works in any density - any DOS. £8.95.

DOS-MOD – Modify Atari DOS to work in true double density when used with 1050 with doubler mod or Happy. Gives 180k capacity on EACH side of the disc. £9.95.

GAMES – A large selection of used ORIGINAL software on tape, disc and cartridge at half new price or less. 5 free games with all orders over £20.

For full details of this range of tape/disc/cartridge utilities and games send large SAE to:

HOWFENSOFT
145 BANKSIDE, WESTHOUGHTON
BOLTON, LANCS.
Overseas add £2 to all orders.

ADVERTISERS' INDEX

TASKMASTER

Auto-convert your tapes (Single, Multi, Long-block etc.) to autoboot disk. The powerful utility, includes assembler, editor, monitor functions, for both new and experienced disk owner

£9 p&p inclusive

RAMBIT II

Re-record your tapes (Single, Multi, Long-block etc.) to load around 600% FASTER with supplied cassette interface. Kit £15 (state cas. model) OR Fitted £22 all inclusive.

Both utilities are suitable for 64k 600XL, 800XL or 130XE. Sold subject to non-infringment of copyright.
Send SAE for details or P/O, Cheque payable to:–

"RAMBIT"
16 The Green, Thurlby, Bourne,
Lincs. PE10 0HB

ATARI REPAIRS

Atari Approved Service Centre

All Atari products repaired, Computers, Printers, Monitors etc

Atari trained engineers

All work fully guaranteed

Free estimates

AVON MICRO CENTRE
Unit 4, Western Road Industrial Estate,
Stratford-upon-Avon, Warwickshire CV37 0AH
Telephone: 0789 292269

Conversational French (5 tapes) £8.95
Knights of the Desert (Disk) £5.95
Spyhunter (Tape) £3.96

Platinum 5.25" D/SD/D Disks box of 10 £5.95

While stocks last
Please add 50p postage per item

PYRAMID

Video & Software
(Inside Osprey Business Computers)
5 The Bridge, Wealdstone
Middlesex, HA3 5AB
01- 861 2407
ALL PRICES INCLUDE VAT

VISA

ATARI 400/800/XL/XE UTILITIES

DISK-TO-DISK UTILITY – our popular disk backup system is designed to duplicate commercial disks that use CRC error **BAD SECTORS** for software protection. The utility also offers rapid backup of unprotected disks. DISK £14.95 **Post Free** (UK*)

DISK-TO-DISK PLUS – a comprehensive backup system comprising Disk-to-Disk (as above), Tape-to-disk, Disk-to-Tape, and Tape-to-Tape utilities. Now Only £24.95 **Post Free** (UK*)

TAPE-TO-DISK UTILITY – upgrade all of your commercial singlestage machine-code game tapes to disk, and load them in a fraction of the time and with 100% reliability. Tape £9.95 **Post Free** (UK*) DISK £10.95 **Post Free** (UK*)

MENULOADER – If used with any of our tape to disk transfer utilities, up to **TEN** transferred singlestage tapes may be stored on **ONE** disk. The games can then be selected from a Menu screen. Disk £12.95 **Post Free** (UK*)

THE ALCHEMIST – upgrade single **AND** multistage commercial machine-code game tapes to disk. This utility transfers many titles that are currently available only on cassette. (Existing Tape-to-Disk users may obtain a **Low Cost Alchemist upgrade.**) send **S.A.E.** for full details

BINARY TAPE EDITOR – will backup single and multistage tapes. Includes an Editor that will enable you to **READ,** and if you wish **ALTER** any text within your machine-code game tapes. If you are stuck on a game, simply scan the tape for clues. Very easy to use TAPE £9.95 **Post Free** (UK*)

TURBOCHARGER XL/XE – bored with lengthy loading times? Turbocharger will backup your tapes at an increased Baud rate. Your backup tapes will load **faster** than the originals. TAPE £9.95 **Post Free** (UK*)

Do you write games on your Atari? – If so, send a **S.A.E.** for details of our new low priced Programmers Utility Pack, featuring machine-code utilities designed to help you create machine code and Basic games.

All software is supplied with full instructions – Free UK postage* – following day despatch. (*Overseas Customers please add £2 to total order.) For details of our complete range of Atari Utilities, drop us a line enclosing a **S.A.E.** P.S. Don't forget, we offer a **FREE** Machine-code game with all orders over £20 (T & D).

J.R. DAVIS (Dept AU)
10 INGRAM AVENUE, HOLMER
HEREFORD HR4 9RD

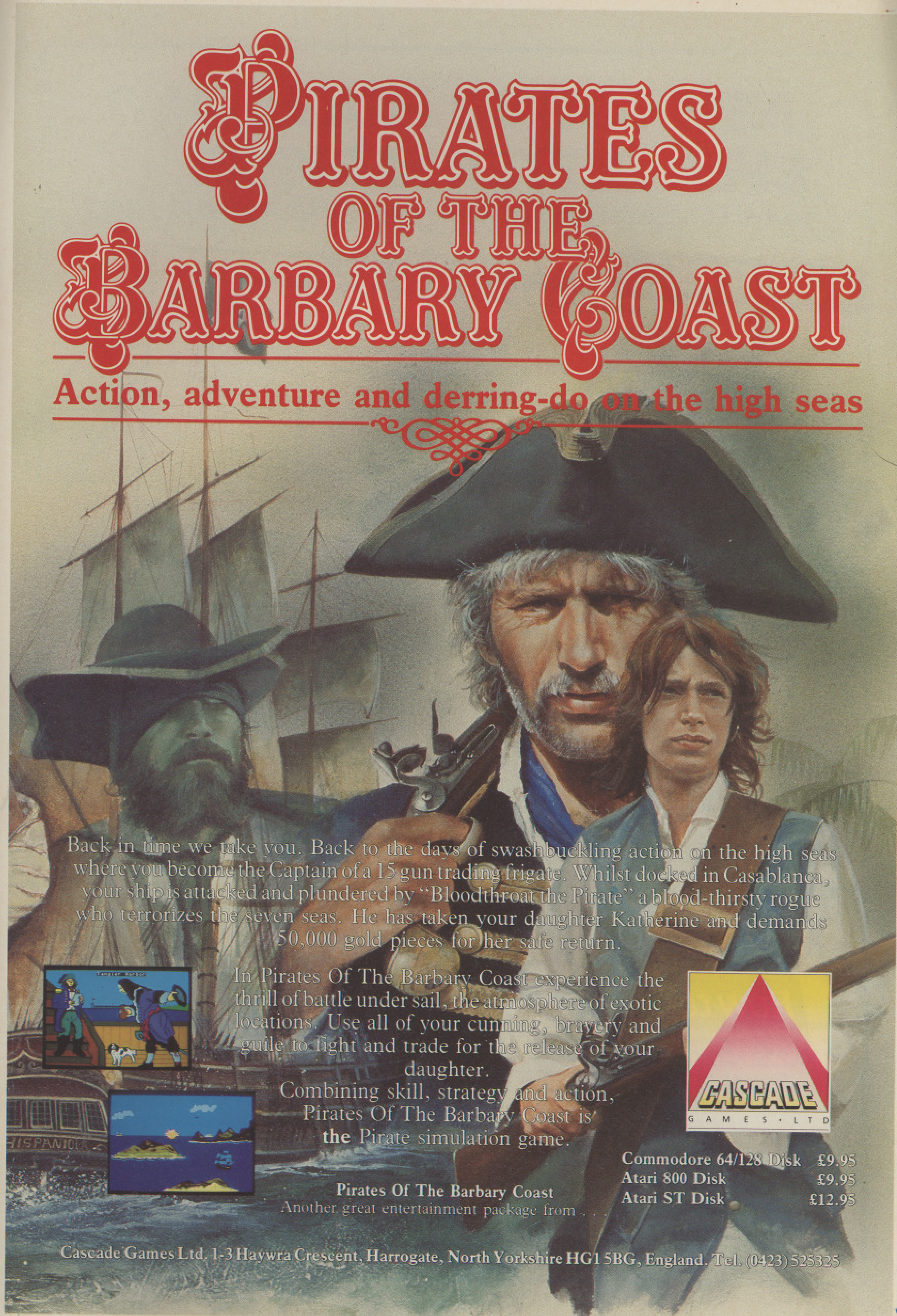
ATARI IN MANCHESTER

For the best selection of Software for your Atari Computer or Video Game Console visit

ATARI WORLD
15 Fennel Street, Manchester 4
(Opposite Victoria Station/Millgate Car Park)

Tel: 061-834 4941. Open: Mon.-Fri. 10-6. Sat. 10-5.30

Mail order with pleasure. Stamp for catalogue


PIRATES OF THE BARBARY COAST
Action, adventure and derring-do on the high seas
Back in time we take you. Back to the days of swashbuckling action on the high seas where you become the Captain of a 15 gun trading frigate. Whilst docked in Casablanca, your ship is attacked and plundered by "Bloodthroat the Pirate" a blood-thirsty rogue who terrorizes the seven seas. He has taken your daughter Katherine and demands 50,000 gold pieces for her safe return.
In Pirates Of The Barbary Coast experience the thrill of battle under sail, the atmosphere of exotic locations. Use all of your cunning, bravery and guile to fight and trade for the release of your daughter.
Combining skill, strategy and action, Pirates Of The Barbary Coast is **the** Pirate simulation game.
CASCADE
GAMES · LTD
Commodore 64/128 Disk £9.95
Atari 800 Disk £9.95
Atari ST Disk £12.95
Pirates Of The Barbary Coast
Another great entertainment package from . . .
Cascade Games Ltd. 1-3 Haywra Crescent, Harrogate, North Yorkshire HG1 5BG, England. Tel. (0423) 525325

NEW LOWER PRICES AND... EVEN BETTER SERVICE!

Now ALL Goods Despatched SAME DAY by 1st CLASS POST-FREE!

PRINTERS

AMAZING PRINTER DEALS SAVE ££££'s
Phone now for details of our Easy Payment Scheme on all these printers.



ATARI SM 804

- 80 Column – Dot Matrix
- 80 CPS
- Friction & Tractor Feed
- 12 Month Warranty

ONLY **£189.00**
SAVE £10!



PANASONIC KX-P1081

- 80 Column – Dot Matrix
- 120 CPS – Draft Mode
- 24 CPS – NLQ Mode
- Friction & Tractor Feeds
- 12 Month Warranty

ONLY **£209.00**
SAVE OVER £70!



MP 165

- 80 Column – Dot Matrix
- 165 CPS – Draft Mode
- 35 CPS – NLQ Mode
- Friction & Tractor Feeds
- Full 2 year Warranty

ONLY **£229.00**
SAVE OVER £30!

- FREE – Atari Writer PLUS Word Processor Disk with ALL Printers
- FREE POSTAGE – All Printers
- EASY PAYMENT SCHEME – Now Available

- All of these Excellent Printers need the "Graphics AT" Interface to connect to your Atari 8 Bit Computer. SAVE £20 – Buy the "Graphics AT" with your Printer for ONLY £39.00 (Normally £59.00)

PAPER

- High Quality 11"x 9½"
- 60gsm Weight
- Micro-Perf all Round
- 2000 Sheets –

ONLY **£14.95**
Post Free!

BOOKS

Get the most from your ATARI Computer with these EXCELLENT BOOKS at special low COMPUMART PRICES (N.B. no VAT on books)

- ATARI 130XE HANDBOOK £6.95
- BASIC – XL EDITION £12.95
- MAPPING THE ATARI £15.95
- YOUR ATARI COMPUTER £18.95
- COMPUTES 1st BOOK OF ATARI GAMES £10.95
- COMPUTES 1st BOOK OF ATARI GRAPHICS £10.95

ALL BOOKS – POST FREE!!!

Also Available

Full range of ATARI 520/1040 Computers, Printers, Monitors, Software, Accessories etc. Ask now for details of our EASY PAYMENT SCHEME on Atari ST's.

How to Order...

- Simply list your order, name and full address with a cheque or postal order (made payable to Compumart) and post to our address opposite or:-
- Phone any of our 3 order lines (24 hours) and order using your credit card. Please give your full name and address, daytime Phone number, details of your order and the name of the magazine you are ordering from.
- All goods are usually despatched same day — 1st class post - FREE OF CHARGE!
- For SPEEDY GUARANTEED NEXT DAY DELIVERY by SECURICOR, Please add JUST £5 to goods total.
- We welcome official written purchase orders from plc's, government and educational establishments etc. Goods will be despatched on receipt of order, 28 day invoice will follow.
- Overseas orders:- please deduct VAT (15%) then add 25% for air mail and insurance. (All payments in £ sterling).
- All prices include VAT. Prices and delivery subject to availability. All goods fully guaranteed.

DISKS & STORAGE

TOP QUALITY 5¼" BULK PACKED DISKS

- Fully Guaranteed
- Individually Certified 100% Error Free
- Supplied in strong white card boxes per 10
- Complete with envelopes, User Labels, Write protect labels etc
- ALL POST FREE!

	10	50	100
Single Sided Double Density	£5.95	£27.95	£49.95
Double Sided Double Density	£7.95	£37.95	£69.95
Double Sided Quad Density (80 Track)	£9.95	£47.95	£89.95



DD100L DISK STORAGE BOX

- Smoked Perspex/High Impact Plastic
- Holds up to 100 Disks
- Hinged Lockable Lid (2 keys)
- Rubber Feet – Dividers

ONLY **£10.95** POST FREE

JOYSTICKS


THE "MICROPHASER"


THE "MICROBLASTER"


THE "JOYBALL"

All three of our Joysticks include the following features:-

- Dual Fire Buttons
- 8-Way Arcade Quality Micro Switches for Precision
- Extra long 5ft Cable
- Single and Rapid Fire Facility
- Non slip Rubber Feet

MICROPHASER ONLY **£9.95**
MICROBLASTER ONLY **£12.95**
JOYBALL ONLY **£9.95**

ALL JOYSTICKS – POST FREE!

Compumart

A GREAT DEAL MORE-FOR A GOOD DEAL LESS!

COMPUMART-DeptATU · Unit 8 · Falcon Street
Loughborough · Leics · LE11 1EH
☎ **0509 – 262259 / 233893 / 266322**